

**IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF WISCONSIN  
GREEN BAY DIVISION**

APPLETON PAPERS INC. and  
NCR CORPORATION,

*Plaintiffs,*

vs.

GEORGE A. WHITING PAPER COMPANY,  
P.H. GLATFELTER COMPANY,  
MENASHA CORPORATION, GREEN BAY  
PACKAGING, INC., INTERNATIONAL  
PAPER COMPANY, LEICHT TRANSFER &  
STORAGE COMPANY, NEENAH  
FOUNDRY COMPANY, NEWPAGE  
WISCONSIN SYSTEM INC., THE  
PROCTOR & GAMBLE PAPER  
PRODUCTS COMPANY, WISCONSIN  
PUBLIC SERVICE CORP., CITY OF  
APPLETON, CITY OF DE PERE, CITY OF  
GREEN BAY, CITY OF KAUKAUNA,  
BROWN COUNTY, GREEN BAY  
METROPOLITAN SEWERAGE DISTRICT,  
HEART OF THE VALLEY  
METROPOLITAN SEWERAGE DISTRICT,  
NEENAH-MENASHA SEWERAGE  
COMMISSION, VILLAGE OF KIMBERLY,  
VILLAGE OF WRIGHTSTOWN, WTM I  
COMPANY and U.S PAPER MILLS  
COMPANY,

*Defendants.*

Case No.: No. 08-CV-00016-WCG

**CERTAIN DEFENDANTS’<sup>1</sup>  
PROPOSED FINDINGS OF FACT**

Pursuant to the Court’s Orders of October 5, 2009 (Dkt. 691 at 4) and November 7, 2009 (Dkt. 750 at 1), Certain Defendants submit their Proposed Findings of Fact.

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<sup>1</sup>The City of Appleton, P.H. Glatfelter Company (“Glatfelter”), Georgia-Pacific Consumer Products LP (f/k/a Fort James Operating Company), Fort James Corporation, Georgia-Pacific LLC (“Georgia-Pacific”), CBC Coating, Inc. (“CBC Coating”), Menasha Corporation, Neenah-Menasha Sewerage Commission, U.S. Paper Mills Corporation (“U.S. Paper”) and WTM I Company (“WTM I”). These Certain Defendants are referred to in this document as “the Defendants” or “Defendants.”

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## **PROPOSED FINDINGS OF FACT**

### **I. SUMMARY**

1. Along the Fox River, NCR Corporation (“NCR”), Appleton Coated Paper Company (“ACPC”) (which is now NCR by virtue of a merger) and Combined Paper Mills, Inc. (“Combined Locks”) (which is also NCR by virtue of a merger) manufactured various components of carbonless copy paper called NCR Paper® (“NCR Paper”) that used polychlorinated biphenyls (“PCBs”). (Proposed Findings of Fact (“PFOF”) Nos. 28; 29; 45; 113-116; 141; 163-164; 168; 171-173.)<sup>2</sup>
2. At no time while NCR and ACPC used PCBs in the production of NCR Paper, from 1954 to Spring 1971, did any Defendant know or have reason to know that NCR Paper contained PCBs or that recycling NCR Paper would result in a release of PCBs to a waterbody, thereby risking environmental harm. (PFOF Nos. 461-470; 487-494; 496-502-506; 525-528; 537-543; 547-551; 556-557; 560-562; 566-579.) In contrast, by a date in the 1950s and certainly no later than February 1967, NCR and its predecessor by merger, ACPC, knew or should have known enough to conclude that recycling their production scrap (“broke”) or their printer and converter customers’ trim risked the release of PCBs to a waterbody. (PFOF Nos. 107-109; 132-155; 163-168; 181-306.)
3. At no time while NCR and ACPC used PCBs in NCR Paper did NCR or ACPC take any steps to stop or to reduce the amount of broke or trim they, or their customers, recycled. (PFOF Nos. 405-430.) At no time during their use of PCBs in NCR Paper did NCR or ACPC take any steps to warn the Defendants that NCR Paper contained PCBs. (PFOF Nos. 50; 70; 405-421; 431; 462-467; 502; 524; 537-538; 552; 562; 567.)
4. Instead of taking actions to reduce the release of PCBs to the Fox River, NCR increased those releases by increasing production of NCR Paper, constructing a facility in Portage, Wisconsin to manufacture PCB-containing emulsion (“NCR Emulsion”), and starting an NCR Emulsion coating operation at Combined Locks, Wisconsin, with direct discharge to the Fox River after save-alls. (PFOF Nos. 445-460.) NCR did not turn off its carbonless copy paper PCB spigot until June 1971. (PFOF Nos. 15-16; 26; 27; 66-71; 72.)
5. Because NCR turned off its PCB spigot in 1971, almost all of the PCBs ever discharged to the Lower Fox River had been discharged by the end of 1971. (PFOF Nos. 14-17; 25-27; 62; 66; 72.) According to the U.S. Environmental Protection Agency (the “EPA”), “[n]inety-eight percent of the total PCBs released into the Lower Fox River had been released by the end of 1971.” (APIFOX00003684, at 701; NCR-FOX-336839, at 847; Williams Expert Report in *NCR v. AIG* at 56, 63 n.177.)

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<sup>2</sup> Unless otherwise indicated, “NCR Paper” as used herein, refers to the NCR’s carbonless copy paper that was made with PCBs.

6. Paper manufacturers and converters like NCR, ACPC, Combined Locks, and their customers, recycled or sold for recycling substantially all of the broke and trim they produced. (PFOF Nos. 66-69.)
7. Of all of the broke and trim containing PCBs ever recycled, almost all was recycled after 1958 and approximately half of the total was recycled after 1966.
8. NCR and ACPC could have taken easy, quick, and inexpensive steps at any time to divert the broke and trim to landfills instead of recycling mills, but chose not to take any of these steps. (PFOF Nos. 430-437.) All of the NCR Paper broke and trim available for recycling by Fox Valley mills made up less than 1% of the total paper recycled by them. (PFOF No. 24.) Accordingly, if NCR Paper broke and trim were not available to the recyclers, it would have had little or no effect on their business. Had NCR or ACPC taken steps to landfill NCR Paper broke and trim or to warn recyclers after NCR knew or should have known that recycling NCR Paper broke and trim risked the release of PCBs to a waterbody, the vast majority of PCBs discharged by recycling mills never would have been discharged into the Lower Fox River. (PFOF Nos. 25-27.)
9. No practical mechanism existed to remove post-consumer NCR Paper in mixed waste, a small component of a large waste stream. (PFOF Nos. 429; 587-588.) In 1972, NCR's employee Alan Kresch said that none of the Defendants could have addressed the PCBs that NCR already had put into the paper recycling stream. (PFOF No. 588; NCR-FOX-0537018, at 020.)
10. In the 1970s, NCR denied to regulators and the paper industry that PCBs or NCR Paper presented risk to the environment. (PFOF Nos. 422-429.)
11. Upon learning that PCBs were in their effluent, the Defendants acted reasonably to address their PCB discharges. (PFOF Nos. 581-913.) Defendants ultimately achieved, and maintained, non-detectable concentrations of PCBs in their effluent.
12. In 1975, NCR said that recycling mills were "innocent victims" of NCR Paper. (PFOF Nos. 470.)

## **II. SOURCES OF PCBs IN THE LOWER FOX RIVER**

### **A. Five Sources of PCB Discharges**

13. PCBs were deposited in Lower Fox River sediments, some of which have moved into Green Bay. (APIFOX00003684, at 712-713; GPFOX00142680, at 682.) The vast majority of the PCBs in the Lower Fox River and Green Bay are linked to Aroclor 1242, the PCB used in the manufacture of NCR Paper. (APIFOX00003684, at 712; GPFOX00089564, at 657-669.)
14. It is undisputed that there are five PCB discharge mechanisms associated with the manufacturing and recycling of NCR Paper:

- A. Waste water discharges from NCR's capsule manufacturing facility in Portage, Wisconsin, to the **Upper** Fox River that may or may not have made their way into the **Lower** Fox River, downstream of Lake Winnebago;
- B. Waste water discharges from ACPC's coating facility, which later became Appleton Coated Papers Division of NCR's coating facility, in Appleton, Wisconsin (the "Appleton Facility"), and the Combined Locks paper mill in Combined Locks, Wisconsin (the "Combined Locks Facility");
- C. Waste water discharges from some of the Fox Valley recycling mill Defendants resulting from the recycling of production scrap (broke) from the Appleton Facility and the Combined Locks Facility;
- D. Waste water discharges from some of the Fox Valley recycling mills as the result of recycling production scrap (trim) from NCR Paper converters and forms manufacturers; and,
- E. Waste water discharges from Fox Valley recycling mills as the result of recycling post-consumer NCR Paper containing PCBs.

(GPFOX00089564, at [577-579](#); Klass Expert Report at [3-4, 7](#), filed at Dkt. 578-6 at 10-11, 13.)

- 15. All five PCB discharge mechanisms were operating during the period in which PCBs were used in the manufacture of NCR Paper (referred to as the "Production Period"). (GPFOX00089564, at [580](#).)
- 16. The first four sources of PCB discharges substantially ended in 1971, because NCR removed PCBs from NCR Paper by June of 1971. (APIFOX00003684, at [701](#); NCR's Responses to Glatfelter's First Set of Interrogatories, [No. 1](#); Klass Decl. ¶ [20](#), filed at Dkt. 578-6 at 5; Klass Expert Report at [4](#), filed at Dkt. 578-6 at 10.)
- 17. Only the fifth PCB discharge mechanism, associated with the recycling of post-consumer waste NCR Paper, remained as a potential source of PCBs during the Post-Production Period and was small compared to the PCB discharges from the other four discharge sources during the Production Period. (Klass Expert Report at [4, 8-12](#), filed at Dkt. 578-6 at 10, 14-17.)
- 18. It is undisputed that: (1) some recyclers recycled broke generated by ACPC during the production of NCR Paper, as well as post-consumer NCR Paper forms, to recover the wood fibers in the paper; and, (2) the PCBs contained in NCR Paper were of no use to the recyclers. (Dkt. 671 ¶ [11](#).)
- 19. Some recycling mills recycled some post-consumer wastepaper grades. (Klass Decl. ¶ [18](#), filed at Dkt. 578-6 at 5.)

20. From 1954 until the last sheets of PCB-containing NCR Paper entered the wastepaper stream, recycling mills that used post-consumer wastepaper grades discharged waste water containing PCBs into the Fox River after varying degrees of treatment. (Klass Decl. ¶ 18, filed at Dkt. 578-6 at 5.)
21. Broke from ACPC represented the most concentrated source of PCBs to Fox River mills.
22. Trim was a much less concentrated source to the Fox River mills because it was dispersed throughout the country. (Klass Expert Report at 12, filed at Dkt. 578-6 at 18.)
23. Mixed office waste contained only a small percentage of NCR Paper and was the least concentrated source of PCBs. (GLTFOX00001900, at 900.) In 1976, Appleton's Vice President for Environmental Control, Walter Spearin, estimated that only 0.75% of the post-consumer, office waste stream was NCR Paper. (GLTFOX00001900, at 900.) The NCR Paper contained in mixed office waste could not be separated. (Klass Expert Report at 17-20, filed at Dkt. 578-6 at 23-26.) The total volume of this mixed office waste was large relative to the waste received by some of Defendants' mills. Had the Defendants' mills tried to avoid purchasing any post-consumer grades, they would have had to shut down or suffer large losses.
24. In any given year, all of the NCR Paper available for recycling by Fox Valley mills made up less than 1% of the total paper recycled by them. If the PCB-containing NCR Paper broke and trim had never been offered for recycling, none of Defendants' mills would have experienced a material disruption in production. (Klass Expert Report at 5, 17, filed at Dkt. 578-6 at 11, 23.)
25. The EPA and the Wisconsin Department of Natural Resources (the "WDNR") estimated that during the Production Period hundreds of thousands of pounds of PCBs were released into the Fox River. (Dkt. 659 ¶ 94.)
26. The EPA and the WDNR also estimated that the vast majority of total PCBs released into the Lower Fox River were discharged before NCR ceased using PCBs in 1971, estimating that 98% of PCBs released into the Lower Fox River had been released by the end of 1971. (Dkt. 659 ¶ 95.) In Plaintiffs' response to the WDNR, they took the position that defendant recycling mills could have taken in paper containing more than 4,000,000 pounds of PCBs during the Production Period, and approximately 40,000 pounds of PCBs in the Post-Production Period. (API-GE031912, at 926.)
27. During the Post-Production Period, PCB discharges were drastically reduced. (APIFOX00000001, at 048; APIFOX00003684, at 701; Klass Expert Report at 15, filed at Dkt. 578-6 at 21.)

**B. Discharges from the NCR Paper Capsule Facility in Portage, Wisconsin**

28. Prior to 1968, NCR produced 100% of its NCR Emulsion at its facility in Dayton, Ohio ("NCR Dayton Facility") and shipped them, via milk tanker trucks, to the facilities where NCR Paper was made, including to ACPC. (Klass Expert Report at 8, filed at Dkt. 578-6 at 14; NCR-FOX-0524051, at 051.)

29. In August of 1968, NCR began producing NCR Emulsion at a facility it built, owned and operated in Portage, Wisconsin (“NCR Paper Capsule Facility”). (NCR’s Responses to Georgia-Pacific’s First Set of Interrogatories, [Nos. 4-5, 8](#); Schwab Dep., [24:17-23](#); Stevens Dep., [76:6-77:4, 191:4-12](#).) Between 1968 and 1971, the NCR Paper Capsule Facility produced approximately 20 million pounds of NCR Emulsion that would have contained approximately 10 million pounds of PCBs. ([NCR-FOX-457462](#); [NCR-FOX-377584](#); NCR-FOX-352047, at [048-053, 054, 055](#).)
30. NCR and API employees also described the NCR Paper Emulsion at the NCR Paper Capsule Facility being lost down the drain, as well as sent to the City of Portage publicly owned treatment works (“POTW”). (Balster Dep. at [124:22-126:7](#); Schumaker Dep. at [77:7-18, 78:7-79:8, 94:3-10](#)).
31. NCR sent waste water from its NCR Paper Capsule Facility to the City of Portage POTW for treatment. (Dkt. 659 ¶ [96](#).) Treated waste water from the City of Portage POTW was discharged into the Upper Fox River. (*Id.*) Waste water from the NCR Paper Capsule Facility contained Aroclor 1242 in mid-1971. ([MONSFOX00098648](#).) In addition to treated discharges, the Portage POTW had a bypass that discharged to the Upper Fox River. Flow from the Upper Fox River flows northeast to Lake Winnebago and the Lower Fox River. (GPFOX00089564 at [577-579](#).)
32. There is no record of NCR having notified the City of Portage POTW of the presence of PCBs in its waste water.
33. In December of 1969, Monsanto tested waste water discharged from the NCR Paper Capsule Facility. (Tucker Dep., [39:25-40:8](#); GPFOX00045395, at [396](#).) The results of the testing included a waste water sample that measured 1,063,000 parts per billion (“ppb”) of Aroclor 1242. (GPFOX00144003, at [003](#); [MONSFOX00098648](#), at [648](#).) Dr. Scott Tucker, Monsanto’s head analytical chemist with respect to PCBs in the environment, testified that the PCB levels in the effluent from the NCR Paper Capsule Facility “were significant levels” and that “the material was fresh and continuously being put in, at that point, at a fairly high level.” (Tucker Dep., [39:25-41:7, 53:4-54:16](#); GPFOX00045395, at [396](#).) In fact, the levels of PCBs in NCR’s effluent were similar to the levels of PCBs found in effluent at Monsanto’s plants where Aroclors were manufactured. (Tucker Dep., [53:23-54:6](#).)
34. From 1972 to 1975, NCR cleaned the NCR Paper Capsule Facility holding tanks multiple times, trying to remove the remaining Aroclor. (NCR-FOX-0096628; APIFOX00033677.)
35. In 1973, NCR measured the Portage Plant effluent and reported that it contained approximately 50 ppb PCB (dry). NCR found PCB levels in the sludge holding tank and supernatant to be 225 and 720 ppm (dry), respectively. (NCR-FOX-0096628.)
36. A July 17, 1975 report issued by Stanton J. Kleinert, Chief of the Wisconsin Department of Natural Resources Surveillance Section, stated:

NCR Appleton Papers Division, Portage: The Appleton Papers Division of National Cash Register Company of Portage, Wisconsin used PCBs in the manufacture of carbonless copy papers prior to the summer of 1971, at which time the company ceased using PCBs. On June 22, 1972, the NCR discharge to the City of Portage POTW still contained 2,230 ppm of PCBs. After repeated cleanings of the facility's holding tanks, the discharge of PCBs was reduced. The latest test result made on May 28, 1975 was 63 ppb. Some PCBs continue to be discharged from the Portage Sewage Treatment Plant, and are believed to be the result primarily of PCB residuals which are still present in the sewer systems of the [NCR Capsule] Plant and the City of Portage.

(NCR-FOX-0162508, at [510](#).)

37. In 1976, the WDNR conducted state-wide sampling for PCBs and reported that the highest PCB values reported in the state were from "Fox River sediments immediately below the outfall of the Portage Waste Water Treatment Plant and from Milwaukee Harbor sediments. The major source of PCBs to the Portage Waste Water Treatment Plant was the Appleton Papers Division of the National Cash Register Company which used PCBs in the manufacture of carbonless paper prior to the summer of 1971." (API-GE001204, at [206](#).)
38. In March 1976, Allen Kresch of NCR stated in a memorandum to Lowell Schleicher that "no PCB cleanup has been done at the Portage plant, to date." ([NCR-FOX-0531055](#)). NCR arranged for the City of Portage Sanitation Department to transport and dispose of the PCB contaminated wastes after cleanup. (*Id.*; [API-FOX-00071359](#))
39. In April 1978, the NCR Appleton Papers Division discussed the PCB situation at the NCR Paper Capsule Facility. Waste samples taken from various areas of the NCR Paper Capsule Facility's sewer system revealed that PCB contamination was still present. Ralph Montello of NCR suggested that Aroclor was still tied up in the plant's sewer lines. ([APIFOX00036711](#).)
40. From January 1978 to April 1978, Aroclor 1242 concentrations were well above 1 ppb in the holding tank and final discharge at the NCR Paper Capsule Facility Plant. PCB levels ranged from 68 ppb to 2980 ppb PCB. ([APIFOX00036711](#), at [712](#).)
41. The 1978 PCB concentrations in the Upper Fox River were higher than those measured within the Lower Fox River during a similar time period (1973-1977), which ranged from < 0.05 ppb to 0.85 ppb. ([APIFOX00000001](#), at [102-119](#).)
42. On July 3, 1980, Dennis Hultgren of Appleton Papers, Inc. wrote a letter to Ralph Montello, Dale Schumaker, and Jerry Taylor explaining that sampling data from 1980 revealed that "there are still considerable high concentrations of PCB's potentially coming from the Portage facility." He stated that concentrations could even be 10 times higher than reported due to dilution of the solvents used to extract the samples, and that

extracting the remaining oil residue in the tank hoods could cause a “considerably high concentration of PCB available going into the sewer.” ([NCR-FOX-0556092](#).)

43. On May 8, 1981, E.F. Bush of Appleton Papers reported that samples taken at the NCR Paper Capsule Facility revealed Aroclor at levels as high as 211 ppm. ([APIFOX00036716](#).)
44. Between 1971 and 1981, NCR consistently reported that waste water samples from its NCR Paper Capsule Facility contained PCBs. ([NCR-FOX-0540749](#), at [753-754](#) (1971 sample with PCB concentration of 900 ppb which “indicate[s] that [NCR] is the major source of PCBs in the Portage area.”); [NCR-FOX-0536242](#), at [553-555](#) (1975 sample with PCB concentrations of 1230 ppb); [APIFOX00036711](#), at [712](#) (1977 sample with PCB concentrations of 2980 ppb); [APIFOX00036716](#), at [716](#) (1981 sample with PCB concentrations of 61 ppb).)

### **C. Discharges from the Appleton Facility and the Combined Locks Facility**

45. During the Production Period, ACPC (and later Combined Locks) mixed the NCR Emulsion with other chemicals and coated it onto rolls of NCR Paper. (NCR’s Responses to Georgia-Pacific’s First Set of Interrogatories, [Nos. 1, 4-5, 8](#); [APIFOX00003795](#).)
46. The Appleton Facility used over 65% of the NCR Emulsion produced between 1954 and 1969. ([APIFOX00000001](#), at [020](#).)
47. During the process of coating the NCR Paper, the Appleton Facility and Combined Locks Facility lost some of the NCR Emulsion. (*See, e.g.*, [APIFOX00000001](#), at [022](#); [BCFOX00027348](#), at [349](#) (acknowledging that “the emulsion would find its way into the backwater . . . despite elaborate precautions.”).) Both facilities lost NCR Emulsion to the process sewers and eventually discharged it as waste water. (Klass Expert Report at [9-10](#), filed at Dkt. 578-6 at 15-16.)
48. The Appleton Facility used air knife coaters to coat the paper with the NCR Emulsion. Some continuous loss of emulsion was normal with the air knife coater designs available in the period from the 1950s through the 1970s. (Klass Expert Report at [9](#), filed at Dkt. 578-6 at 15.)
49. The Appleton Facility discharged at least some of its process waste water to the City of Appleton POTW (“Appleton POTW”) that in turn discharged into the Lower Fox River. (Hultgren Dep. (March 18, 2009), [16:21-17:23](#), [28:23-40:1](#); Gerald Taylor Dep., [209:25-213:14](#); [GPFOX00089564](#), at [585](#), [600](#); Klass Expert Report at [9](#), filed at Dkt. 578-6 at 15.)
50. There is no evidence of NCR or its predecessors at the Appleton Facility ever informing the Appleton POTW during or after the Production Period of the presence of PCBs in its products or in its waste water. ([COA-FOX-00020224](#); [COA-FOX-00006031](#).) The waste water from ACPC and Combined Locks constituted a substantial part of the discharge of PCBs to the Lower Fox River during the Production Period.

51. Monsanto analyzed air samples taken at ACPC for PCBs (Tucker Dep., 68:19-23), and found Aroclor 1242 was present in the air samples at concentrations of 4.1-7.5 and 4.8-8.8  $\mu\text{g}/\text{m}^3$ . (MONSFOX00088213.) These results were shared with ACPC. (Tucker Dep., 71:17-22.)
52. The Combined Locks Facility discharged waste water directly into the Lower Fox River, after save-alls. (Dkt. 54 at 3; Dkt. 664 ¶¶ 21-22; Klass Expert Report at 10, filed at Dkt. 578-6 at 16; API-GE004392, at 399-400.)

**D. Discharges from the Recycling of NCR Paper Broke**

53. Production of NCR Paper at the Appleton Facility and the Combined Locks Facility generated the following wastes: scrap from side trimmings; off-grade paper and scrap from roll ends; broken rolls; and folded rolls during paper machine breaks. Collectively, this production scrap is called “broke.” (NCR’s Responses to Georgia-Pacific’s First Set of Interrogatories, No. 3.)
54. In 1976, NCR estimated that NCR Paper broke contained approximately 3% PCBs by weight. (GLTFOX00001900, at 903; APIFOX00000001, at 021.) At 3% PCBs by weight, a 1500-pound bale of NCR Paper broke would contain approximately 45 pounds of PCBs.
55. The Appleton Facility was not a paper mill and generally could not recycle or use its broke internally. (Dkt. 334 ¶ 18.)
56. NCR Paper broke was collected and sorted according to characteristics important to recyclers, such as color, weight, and presence of goldenrod dye in the base paper. The sorted NCR Paper broke was then baled and tagged with a multi-part label indicating the bale’s grade and weight. The number of bales and their weights were recorded on a Daily Broke Report and the facility’s accounting ledgers. After sufficient bales were assembled, bids were solicited from brokers or dealers who sold fiber to paper mills. ACPC would negotiate a price. The facility would then prepare a shipping order. The brokers were invoiced and revenues were recorded in the facility’s accounting ledgers. There were detailed procedures developed by NCR for the handling of NCR Paper broke. (NCR’s Responses to Georgia-Pacific’s First Set of Interrogatories, No. 3.)
57. ACPC segregated its broke by grade in order to get the highest price for the various grades of wastepaper. (Klass Expert Report at 16, filed at Dkt. 578-6 at 22.) ACPC segregated the PCB-containing NCR Paper broke into categories – only the categories containing CB and CFB would have contained PCBs. (Hietpas Dep., 50:24-51:5; NCR-FOX-318041, at 049; Strelow Dep., 29:10-33:11; Klass Expert Report at 16, filed at Dkt. 578-7 at 22.)
58. ACPC and its successor NCR sold NCR Paper broke to wastepaper brokers who they knew would sell the broke to recyclers, including some recyclers located along the Lower Fox River. (Dkt. 334 ¶¶ 18, 21-22; Dkt. 659 ¶ 24; Dkt. 661 ¶ 29; Klass Expert Report at 16, filed at Dkt. 578-6 at 22.)

59. Some of the defendant recycling mills that purchased broke discharged treated waste water into the Lower Fox River. (Dkt. 297 ¶ 32 (Glatfelter); Dkt. 300 ¶ 48 (WTM I); APIFOX00000001, at 009-011; Klass Decl. ¶ 14, filed at Dkt. 578-6 at 4.)
60. Paper recycling mills that purchased NCR Paper broke and trim purchased such broke and trim to recover paper fiber and not to recover PCBs. (NCR's Responses to Menasha's First Set of Interrogatories, Nos. 130, 131.)
61. During the Production Period, the Defendant recycling mills' waste water discharges were treated using reasonable and appropriate methods but, unknown to them, may have contained PCBs. (Ford Expert Report at 5, 13-30; Klass Decl. ¶ 14, filed at Dkt. 578-6 at 4; PFOF Nos. 600-603; 605-606; 608-610; 676-693; 743-750; 759-761; 783-797; 814-840; 844-845; 846-850; 854-856; 858-871; 878-891; 893; 902-913.)
62. Discharges related to the recycling of NCR Paper broke and trim ended in 1971, after NCR stopped manufacturing NCR Paper with PCBs during the Spring of 1971. (Dkt. 664 at ¶¶ 26-27.)
63. NCR and ACPC never instructed its employees to stop selling the categories of broke that contained PCBs.
64. NCR and ACPC never warned paper brokers of the presence of PCBs in some NCR Paper broke.
65. NCR and ACPC never warned Defendants of the presence of PCBs in some NCR Paper broke during the Production Period.

#### **E. Discharges from Recycling NCR Paper Converter Trim and Scrap**

66. From 1954 until the inventory of PCB-coated NCR Paper was used up (some time shortly after Spring 1971), NCR sold PCB-coated NCR Paper to printers and converters of business forms. (Dkt. 664 ¶ 28; GPFOX00089564, at 579; Hultgren Dep. (Mar. 18, 2009), 16:21-18:12.) Printers and converters of business forms sold trim to recycling mills. (Dkt. 664 ¶ 29.)
67. NCR operated a substantial paper converting subsidiary called Systemedia. Systemedia was one of NCR's single largest customers for NCR Paper, and generated trim. (NCR-FOX-0523719, at 720-721; Taylor Dep., 285:16-25.)
68. Trim was sold as post-industrial wastepaper in all regions of the country. (Klass Expert Report at 12, filed at Dkt. 578-6 at 18.)
69. Trim would be baled and sold to paper brokers. (Klass Expert Report at 11-12, filed at Dkt. 578-6 at 17-18.)
70. NCR and its predecessors never informed NCR Paper converters (other than NCR's own Systemedia subsidiary) of the presence of PCBs in NCR Paper. There is also no evidence that NCR ever instructed NCR Paper converters not to recycle trim.

71. Waste water discharges from some Fox Valley recycling mills recycling trim from 1954 until sometime shortly after Spring 1971 contained PCBs. (Klass Decl. ¶ 16, filed at Dkt. 578-6 at 5.)
72. PCB discharges related to the recycling of converter trim likely ended in 1971, after NCR stopped manufacturing NCR Paper with PCBs that Spring. (Klass Expert Report at 11–12, filed at Dkt. 578-6 at 17-18.)

### **III. BACKGROUND ON THE REMEDIATION OF THE LOWER FOX RIVER**

73. The Bergstrom Mill (operated by Bergstrom Paper Co. 1904-1979, which merged into P.H. Glatfelter Company until the mill shut down in 2006), the Wisconsin Tissue Mills mill (owned by WTM I until 1999), Neenah-Menasha Publicly Owned Treatment Works (the “NM POTW”) and the John Strange Mill (owned by Menasha Corporation until 1983 and currently owned by U.S. Paper Mills Corp.) discharged into OU 1.
74. The Appleton POTW discharged into OU 2.
75. The Riverside Paper Mill (owned by CBC), the Appleton Facility and the Combined Locks Facility, which beginning in 1969 was owned by NCR, discharged into OU 2. ([http://www.ncr.com/about\\_ncr/company\\_overview/history.jsp](http://www.ncr.com/about_ncr/company_overview/history.jsp).)
76. The De Pere Mill (owned by U.S. Paper) and Fort Howard Green Bay West Mill (owned by Georgia-Pacific) discharged into OU 4.
77. Sampling for PCBs in Wisconsin began in the 1970s in an effort to locate the source of PCBs that were appearing in food packaging. (NCR-FOX-0049844.) Trace concentrations of Aroclor 1242 were reported in many samples, with significantly higher concentrations found in the City of Portage POTW that serviced NCR’s emulsion production facility along the Upper Fox River. (Rodricks Expert Report at 14.) Fish consumption advisories went into effect on the Upper Fox River near Portage in the early 1970s and on the Lower Fox River and Green Bay beginning in 1976. (*Id.*, citing API-GE001204; NCR-FOX-0550786, at 805.)
78. In 1986, the WDNR began a Remedial Action Plan (“RAP”), under the Great Lakes Water Quality Agreement, to clean up the Lower Fox River and Green Bay Site (the “Site”) which includes the entire 39-mile stretch of the Lower Fox River and the bay of Green Bay. (Rodricks Expert Report at 14; APIFOX00082996, at 034.) The WDNR set up a RAP committee for the Site and sent invitations to stakeholders to participate. Initially, the RAP committee rejected the Superfund process, believing that litigation would impede the cleanup. (Rodricks Expert Report at 14, citing [http://foxriverwatch.com/fox\\_river\\_history\\_pcb.html](http://foxriverwatch.com/fox_river_history_pcb.html).)
79. In 1989, the EPA and the WDNR began sediment and water sampling at the Site as part of the Green Bay Mass Balance Study. The study was a pilot project to test the feasibility of using a mass balance approach for assessing the sources and fates of pollutants spreading through the food chain. (APIFOX000003684, at 702; APIFOX000003795, at 817; Rodricks Expert Report at 14.)

80. Also, in 1989, the WDNR and United States Fish and Wildlife Service of the United States Department of the Interior (“USF&WS”) met to discuss legal actions to enforce cleanup of the Fox River. By 1993, the WDNR began investigating a possible state Natural Resources Damage Assessment (“NRDA”) for the Lower Fox River and Green Bay Site.
81. In 1993, the USF&WS asked the WDNR to work with it as a co-trustee in a federal NRDA. The WDNR declined. (NCR-FOX-0524291, at 311.)
82. In 1994, the USF&WS publicly announced plans to start a federal NRDA. (APIFOX000003684, at 703.) Beginning in the mid-1990s, the USF&WS began assessing the environmental damage to the Lower Fox River and Green Bay. (Dkt. 227, at 2.)
83. On June 20, 1994, USF&WS identified five Potentially Responsible Parties (“PRPs”): Fort James Corporation, Glatfelter, Riverside Paper, U.S. Paper and WTM I transmitted notices of intent to perform an assessment and invitations to participate in the NRDA. (NCR-FOX-0524291, at 311; APIFOX00083944, at 4032.)
84. On February 2, 1996, USF&WS identified two more PRPs, API and NCR, and transmitted notices of intent to perform an assessment and invitations to participate in the NDRA. (APIFOX00083944, at 4032.)
85. On July 28, 1998, the EPA proposed to place the Site on the National Priorities List. (63 Fed. Reg. 40,247; UAO November 15, 2007, at 13, available at [http://www.epa.gov/region5/sites/foxriver/pdf/wisctiss\\_aoc\\_final.pdf](http://www.epa.gov/region5/sites/foxriver/pdf/wisctiss_aoc_final.pdf).)
86. In 1994, Fort Howard Company (now Georgia-Pacific) joined together with Glatfelter, WTM I, U.S. Paper, and Riverside Paper to form the Fox River Group (“FRG”), which NCR and API later joined in 1997. (Dkt. 310 ¶¶ 53-55.)
87. The FRG entered into an agreement with the State of Wisconsin in 1997 under which the FRG as a group agreed to provide \$10 million for a State NRDA and certain resource restoration and dredging demonstration projects. (APIFOX000003684, at 703; APIFOX000003795, at 819.) The FRG and the WDNR agreed on Sediment Management Units 56 and 57 (“SMUs 56/57”), located downstream of the Fort Howard outfall, as the location for a dredging demonstration project, which began on August 30, 1999. (APIFOX000003684, at 704-705; APIFOX000003795, at 819.) During 1999, the FRG removed approximately 31,350 cubic yards of sediment and more than 1,400 pounds of PCBs from the river. (APIFOX000003684, at 705; APIFOX000003795, at 819.)
88. In May 2000, Georgia-Pacific’s predecessors entered into an Administrative Order By Consent (Docket No. V-W-00-C-596) with the EPA and the State to complete the PCB dredging project at SMU 56/57. (Dkt. 310 ¶ 54; Dkt. 759 ¶ 3; Dkt. 759-1 at 14.) The work was completed at an additional cost of \$15 million (in direct and in-kind services). (Dkt. 310 ¶ 54; Dkt. 759 ¶ 3; Dkt. 759-1.) It resulted in the removal of an additional

50,316 cubic yards of sediment and another 670 pounds of PCBs from the river. (APIFOX000003684, at 705; APIFOX000003795, at 819.)

89. On October 5, 2001, the EPA and the WDNR issued a proposed plan for cleanup of the Site. (APIFOX000003684, at 705; UAO November 15, 2007, at 13 *available at* [http://www.epa.gov/region5/sites/foxriver/pdf/wisctiss\\_aoc\\_final.pdf](http://www.epa.gov/region5/sites/foxriver/pdf/wisctiss_aoc_final.pdf).)
90. On December 10, 2001, the EPA and the WDNR entered into a Consent Decree with NCR and API. (Civ. Action No. 01-C-0816, E.D. Wis.) Under the Consent Decree, NCR and API agreed to pay \$41.5 million in exchange for the forbearance of litigation by the governments and the natural resource trustees during the term of the Consent Decree and agreement to mediate certain governmental claims. Most of the payments made by NCR and API were to go to interim natural resource damage restoration projects; \$10 million of these funds were used by the governments to assist in funding the remedial action at OU 1. (APIFOX000003684, at 705; <http://www.epa.gov/region5/sites/foxriver/pdf/consent-decree-appleton-papers-200810.pdf>.) This agreement was subsequently extended in exchange for further payments by Plaintiffs of up to \$6 million. (Consent Decree Modification and Partial Extension, Civ. Action No. 01-C-0816, E.D. Wis., filed January 24, 2006.)
91. The EPA has found that the total mass of PCBs discharged to the Lower Fox River was approximately 690,000 pounds, about 675,000 pounds of which occurred during the Production Period, before any of the Defendants knew that PCBs were contained in NCR Paper. (Dkt. 664 ¶ 41; APIFOX000003684, at 701; APIFOX000003795, at 815; API-GE004392, at 400.)
92. In December 2002, the EPA and the WDNR issued the ROD for OUs 1-2. (APIFOX000003684.)
93. On January 29, 2003, the EPA, the WDNR and Fort James Operating Company (predecessor to Georgia-Pacific) entered into an Administrative Order on Consent under which \$4 million was provided by Fort James Operating Company to support characterization and contaminant delineation work primarily in OU4. (APIFOX000003795, at 821.)
94. On June 30, 2003, the EPA issued the ROD for cleanup of OUs 3-5. (UAO November 15, 2007, at 14, *available at* [http://www.epa.gov/region5/sites/foxriver/pdf/wisctiss\\_aoc\\_final.pdf](http://www.epa.gov/region5/sites/foxriver/pdf/wisctiss_aoc_final.pdf).)
95. In July 2003, the EPA, the WDNR and WTM I entered into an Administrative Order on Consent (Docket No. V-W-'03-C-745) under which WTM I agreed to perform remedial design for the selected remedy for OU 1 at the Site. (UAO November 15, 2007, at 14, *available at* [http://www.epa.gov/region5/sites/foxriver/pdf/wisctiss\\_aoc\\_final.pdf](http://www.epa.gov/region5/sites/foxriver/pdf/wisctiss_aoc_final.pdf).)
96. On September 30, 2003, the EPA sent Menasha Corporation a general notice letter naming Menasha Corporation a PRP for OUs 2-5. (API-GE036913.)

97. In 2004, Fort James Operating Company (predecessor to Georgia-Pacific) settled a potential natural resource damages claim by the Government, agreeing to preserve 1,060 acres of wetlands, to pay \$8.5 million for other restoration projects, to pay \$1.55 million to offset resource damages assessment costs, and to pay \$50,000 in costs associated with SMU 56/57. (*See United States v. Fort James Operating Co.*, 313 F. Supp. 2d 902, 906 (E.D. Wis. 2004).)
98. On March 5, 2004, Fort James Operating Company (predecessor to Georgia-Pacific) and NCR entered into an administrative settlement agreement with the EPA and the WDNR captioned *In re Lower Fox River and Green Bay Site*, CERCLA Docket No. V-W-'04-C-781) to perform the remedial design for OUs 2-5. (UAO November 15, 2007, at 14, available at [http://www.epa.gov/region5/sites/foxriver/pdf/wisctiss\\_aoc\\_final.pdf](http://www.epa.gov/region5/sites/foxriver/pdf/wisctiss_aoc_final.pdf).)
99. On April 12, 2004, the EPA and the WDNR entered into a Consent Decree (Civ. Action No. 03-C-0949, E.D. Wis.) with Glatfelter and WTM I, under which Glatfelter and WTM I agreed to undertake remedial action in OU 1. Glatfelter and WTM I each contributed \$26,250,000 to an OU1 Escrow Account to fund remediation and restoration work and made additional payments totaling \$775,000 each for agency costs and natural resource restoration efforts. (UAO November 15, 2007, at 17-18, available at [http://www.epa.gov/region5/sites/foxriver/pdf/wisctiss\\_aoc\\_final.pdf](http://www.epa.gov/region5/sites/foxriver/pdf/wisctiss_aoc_final.pdf); NCR-FOX-0610939; <http://www.epa.gov/region5/sites/foxriver/pdf/consent-decree-operable-unit-1-20071220.pdf>.)
100. On November 3, 2006, NCR and U.S. Paper entered into a Consent Decree with the EPA and the WDNR for the Performance of Phase 1 Remedial Action in the southern portion of OU 4 of the Lower Fox River. ([http://www.epa.gov/region5/sites/foxriver/pdf/consent\\_decree\\_200604.pdf](http://www.epa.gov/region5/sites/foxriver/pdf/consent_decree_200604.pdf))
101. In 2007, Menasha Corporation agreed to deposit \$7 million into the OU 1 Escrow Account to secure performance of the remediation work in OU 1. Also in 2007, WTM I and Glatfelter made additional payments of \$6 million each into the OU1 Escrow Account. (NCR-FOX-0611032.)
102. On June 26, 2007, the EPA issued an amended ROD for OUs 2-5. (UAO November 15, 2007, at 14, Appendix 3, at 1; available at <http://www.epa.gov/region5/sites/foxriver/pdf/rodfinal20070628.pdf>.)
103. On November 14, 2007, the EPA issued a Unilateral Administrative Order (Docket No. V-W-08-C-885) (the "November 14, 2007 UAO") requiring NCR, API, CBC, Georgia-Pacific, Menasha Corporation, U.S. Paper, Glatfelter and WTM I to implement the selected remedy for OUs 2 through 5. (Rodricks Expert Report at 15; *API v. George A. Whiting Paper Co.*, 572 F. Supp. 2d 1034, 1037 (E.D. Wisc. 2008); <http://www.epa.gov/region5/sites/foxriver/pdf/fox-river-uao-20071113.pdf>.)
104. In June 2008, the EPA issued a Record of Decision Amendment for OU 1. (*See* <http://www.epa.gov/region5/sites/foxriver/pdf/rod-ou1-200806.pdf>.)

105. On August 13, 2008, an Amended Consent Decree for OU 1 was entered into between the United States, the State of Wisconsin, P.H. Glatfelter and WTM I for continuing remedial action in OU1 consistent with the ROD Amendment for OU1. The Amended Consent Decree required additional payments to the OU1 Escrow Account of \$9.5 million each from both WTM I and Glatfelter. (NCR-FOX-0611032.) In 2009, the EPA announced that the remediation of OU1 had been completed. (<http://www.epa.gov/region5/sites/foxriver/pdf/current-summer-2009.pdf>.)
106. It is undisputed that the remediation of PCBs in OUs 2-5 of the Lower Fox River has been estimated to cost at least \$700 million in total response costs alone. (Dkt. 671 ¶ 9.) In addition, payments made towards the remediation of OU1 have exceeded \$100 million. (PFOF Nos. 95; 99; 101; 102; 104; 105.)

#### **IV. NCR WAS A SCIENTIFICALLY SOPHISTICATED TECHNOLOGY COMPANY**

107. NCR's development of various product lines, and its derived successes, were due to the company's ability to conduct original research, acquire technology companies, and in general be aware of scientific advancements that can be applied in the development of commercial products. (Rodricks Expert Report at 21.) Sometimes, the science and technology employed by NCR was developed in-house. (*Id.*)
108. The NCR – ACPC partnership started out as two companies joining forces to apply a science-based process to a commercial endeavor. (Rodricks Expert Report at 22; APIFOX00023577, at 600.) NCR was the “brain,” it held the key technology of NCR Emulsion and the technical coating know-how, and ACPC was the “muscle,” operating the Appleton Facility as the contract coater. (Rodricks Expert Report at 22; APIFOX00023577, at 600.)
109. NCR employed numerous scientists across several fields. For example, the NCR Materials Research Department (sometimes called Fundamental Research Department), which developed NCR Paper, employed 146 individuals between 1951 and 1971. Of these 146 individuals, at least had 42 advanced scientific degrees (Masters or Doctorate). (Schwab Dep., 179:7-189:18; NCR-FOX-343197, at 212-214.) NCR Materials Research/Fundamental Research invented NCR Paper and worked to modify it. Another NCR-Dayton department, the Material Analytical Services Department, also employed chemists, including ones with advanced scientific degrees (Masters or Doctorate). (Clark Dep., 138:2-139:8.) At any given time in the 1960s and 1970s, there were between 50 and 100 chemists employed by NCR. (Clark Dep., 138:11-20.) In addition to chemists, NCR also employed chemical engineers. (Clark Dep., 140:24-141:2.) Material Analytical Services' charter was to be the chemical and physical testing organization for NCR-Dayton to perform tests according to some standard procedure, whether it would be ASTM, ANSI or NCR's own internal standards. (Clark Dep., 52:17-53:8.) Material Analytical Services had a plastics research group, a metallurgical research group, a finishes control group and a manufacturing laboratory. (Clark Dep., 51:1-52:12.) Material Analytical Services tested components of NCR Paper. (Clark Dep., 69:2-70:3.)

**V. PLAINTIFFS' HISTORY AND THEIR RELATIONSHIP TO EACH OTHER AND THE LOWER FOX RIVER**

110. NCR was founded in 1884 in Dayton, Ohio. (Dkt. 659 ¶ 13.)
111. In 1889, the Combined Locks Paper Company was founded at Combined Locks, Wisconsin. (Dkt. 659 ¶ 14.) In 1966 the Combined Locks Paper Company changed its name to Combined Paper Mills, Inc. (“Combined Locks”). (Dkt. 659 ¶ 15.)
112. On July 31, 1969, NCR acquired the stock of Combined Locks. (Dkt. 659 ¶ 16.)
113. Beginning in 1969 or early 1970, Combined Locks began coating paper with NCR Emulsion. From this point through mid-1971, NCR directly discharged waste water containing PCBs from the Combined Locks Facility, after save-alls, to the Lower Fox River. (Dkt. 54 at 3; Dkt. 664 ¶¶ 21-22.)
114. In 1907, ACPC was founded at Appleton, Wisconsin as a specialty paper coater. (Dkt. 659 ¶ 17.)
115. In 1953, NCR began partnering with ACPC to coat NCR Paper with NCR Emulsion. (APIFOX00033033, at 034.)
116. NCR manufactured the NCR Emulsion, which it sold to ACPC. ACPC coated the NCR Emulsion onto specialty paper, which ACPC then sold back to NCR. (Dkt. 657 ¶¶ 12-15.)
117. By the 1960s, ACPC was heavily dependent on NCR for its overall revenues and profit margins. (APIFOX00023577, at 600.) By 1963 “over 60% of its [ACPC’s] sales volume and almost 90% of its operating profit[s were] concentrated” in the NCR Paper business. (APIFOX00023577, at 578.) The concentration of ACPC’s business in the production of NCR Paper continued throughout the 1960s as ACPC added substantial capacity to increase its production of NCR Paper. (APIFOX00032218, at 224; NCR-FOX-0523719, at 727.)
118. In 1970, NCR acquired the stock of ACPC, which became a wholly-owned subsidiary of NCR. (Dkt. 659 ¶ 18.)
119. On June 21, 1971, NCR merged its two subsidiaries, Combined Locks and ACPC, to create Appleton Papers, Inc. (not the same as “API”), a subsidiary of NCR.<sup>3</sup> (Dkt. 659 ¶ 19.)
120. On January 1, 1973, Appleton Papers, Inc. merged with NCR and changed from a subsidiary of NCR to a division of NCR. (Dkt. 659 ¶ 20.)

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<sup>3</sup> Note that Appleton Papers Inc., which will be referred to herein as “API” is not the same corporate entity as Appleton Papers, Inc. (with a comma). To help avoid confusion, Appleton Papers, Inc. will not be abbreviated.

121. In 1978, B.A.T. Industries Limited acquired the assets of Appleton Papers, Inc. division from NCR. (API 10K, Dec. 29, 2007.)
122. In 1990, Appleton Papers, Inc. and UK-based Wiggins Teape Group, Ltd., another B.A.T. paper company, were separated from B.A.T. Industries and merged to form Wiggins Teape Appleton p.l.c. (API 10K, Dec. 29, 2007.)
123. In 1990, Wiggins Teape Appleton p.l.c. then merged with French paper group, Arjomari-Prioux, and changed its name to Arjo Wiggins Appleton p.l.c. and operated as an indirect, wholly-owned subsidiary of Arjo Wiggins Appleton p.l.c. until 2001. (API 10K, Dec. 29, 2007.)
124. On November 9, 2001, Appleton Papers, Inc.'s employees acquired the company's assets from Arjo Wiggins Appleton p.l.c. ("AWA") and, effective February 3, 2003, changed its name to API. (API 10K, Dec. 29, 2007.)
125. Plaintiff API is the current owner or operator of the Appleton Facility. (API's Responses to Menasha Corporation's First Set of Requests for Admissions, at 4.)
126. In conjunction with its acquisition of the company from AWA, API entered into an indemnification agreement providing that AWA will indemnify API "for, and pay, all governmental and third party liabilities and all costs and expenses incurred by API in defense against governmental and third party claims, referred to as the Fox River Liabilities," including "fees and expenses of API's environmental counsel, advisers, engineers and scientific experts, and the costs incurred in obtaining studies and other analyses concerning various remedial alternatives for the Lower Fox River," pursuant to a cost-sharing formula. (API 10Q, July 4, 2004, at 7.)
127. NCR is the corporate successor in interest to ACPC and Combined Locks, resulting from 1969/1970 stock acquisitions and a merger in 1973. (Dkt. 659 ¶¶ 19-20.)

## **VI. DEVELOPMENT AND MANUFACTURE OF NCR PAPER**

### **A. Description of NCR Paper and How It Works**

128. In its simplest form, NCR Paper involves two sheets of paper, a top sheet with coating on the back (called "coated back" or "CB") and a bottom sheet with coating on the front (called "coated front" or "CF"). (Bodmer Dep., 17:9-18:12; Schumaker Dep., 20:8-24.)
129. During the Production Period, the backside of the CB sheet was coated with PCB-containing NCR Emulsion. (Bodmer Dep., 20:18-21:22.)
130. In a typical three-part business form, three kinds of carbonless paper work together as a system to transfer images cleanly and clearly from one sheet to the next. The top sheet is a "CB" (coated back) sheet, the back of which is covered with a coating made of millions of microscopic capsules containing colorless dyes. The last sheet is a "CF" (coated front) sheet, coated on its front side with a coreactant or receiver material. The middle sheet is a "CFB" (coated front and back) sheet, front-coated with receiver materials and back-

coated with dye capsules. As pressure from a pen or printer is applied to the top sheet, the dye capsules on the CB surface break and interact with the CF receiver coating to develop a black or blue image on each copy. CB and CFB sheets contained Aroclor 1242, a type of PCB. (NCR-FOX-0519321, at 325.)

131. By assembling these sheets in a proper order, a converting mill could manufacture a multi-sheet business form that would allow a user to create multiple copies of the writing or typing on the top sheet without use of carbon paper. (API-GF038544, at 545.)

#### **B. NCR Invents Carbonless Copy Paper**

132. NCR commercially produced NCR Paper beginning in 1953 or 1954. (Dkt. 659 ¶ 23; Dkt. 657 ¶ 11.)
133. NCR experimented with using various Aroclors for use in the capsules for NCR Paper, including Aroclor 1221, 1232, 1242 and 1254. (NCR-FOX-0566659, at 727-728.)
134. To make NCR Paper, NCR designed and manufactured microcapsules at the NCR Dayton Facility from 1953 to 1971, in Portage, Wisconsin, from 1968 to 1971, in Boreham Wood, UK, from 1957 to 1970, and Oiso, Japan, starting in 1969. (NCR's Responses to Georgia-Pacific's First Set of Interrogatories, Nos. 1, 5.)
135. "Encapsulation can be considered a special form of packaging in that particulate matter can be individually coated for protection . . . microencapsulation provides a means of – packaging, separating and storing materials – on a microscopic scale for later release under controlled conditions." (APIFOX00026934, at 935.) The material encapsulated can later be released by either physical rupture, or by disintegration of the walls by electrical or chemical means, or by leaching in a liquid environment." (*Id.*) NCR employed microencapsulation technology with pesticides, as well as PCBs. (Rodricks Expert Report at 23.)
136. "The NCR encapsulation process used microcapsules of a waxy material to enclose the colorless dye dissolved in PCBs." (APIFOX00003684, at 701.) In this way, the microcapsules in the NCR Emulsion would remain intact until ruptured. (*Id.*; Rodricks Expert Report at 24.) NCR used the encapsulation process in the development of its NCR Paper. (*Id.*)
137. In 1942, NCR scientists Barrett K. Green and Lowell Schleicher included an oil phase within a gelatin shell to prepare the first NCR Paper gelatin microcapsules. (Rodricks Expert Report at 24.)
138. Between 1953 and 1971, NCR's microcapsules contained dyes dissolved in PCBs. (NCR's Responses to Glatfelter's First Set of Interrogatories, No. 1; API's Responses to Glatfelter's Interrogatories, No. 1.)
139. The scientists employed by NCR's Materials Research Department also experimented with microencapsulation in other applications using a wide variety of chemicals other than PCBs. (Herbig Dep., 28:20-30:15.)

140. Only NCR, and NCR's contract coater (ACPC) and licensees (Mead Corporation and Nekoosa Edwards) used PCBs in the manufacture of carbonless copy paper in the United States. (NCR's Responses to Georgia-Pacific's First Set of Interrogatories, No. 4; API-GE033537, at 538.)
141. NCR is the only party in this action that controlled the chemical constituents of NCR Paper and is the only party that directly and intentionally used PCBs in its manufacturing operations. (NCR's Responses to Georgia-Pacific's First Set of Interrogatories, No. 4; API-GE033537, at 538-539.)

**C. Description of the PCBs in NCR Paper**

142. Monsanto was the sole manufacturer of PCBs in the United States. (Dkt. 661 ¶ 1.) Monsanto manufactured and marketed its PCBs under the trade name Aroclor. Aroclors were mixtures of PCBs produced for commercial and industrial applications. (Tucker Dep., 47:23-48:15, 64:19-65:7.) Monsanto marketed a PCB mixture called Aroclor 1242. (Dkt. 659 ¶¶ 21-22; Kresch Dep., 113:23-114:1; Jezerc Dep. (April 20, 2009), 75:22-76:2.)
143. Each Aroclor was manufactured by Monsanto to have an average percentage of chlorination. (Dkt. 661 ¶ 3.) In general, Monsanto named its Aroclors to indicate the predominant degree of chlorination present in a given Aroclor mixture. (*Id.*) Thus, Aroclor 1242, had 42 percent chlorination, on average, while Aroclor 1254 had, on average, 54 percent chlorination. (*Id.*) However, all Aroclors were mixtures composed of a variety of components of higher or lower chlorinated PCBs. A given Aroclor mixture would contain ratios of higher and lower chlorinated PCBs to arrive at the general average chlorination. (Rodricks Expert Report at 17.)
144. According to W.B. Papageorge, Monsanto's point person on PCBs starting in the late 1960s, Aroclor 1242 contains about 10 percent of the five chlorine and higher isomers which include PCBs or more than 42 percent chlorine, such as the more persistent Aroclors 1248 (48 percent chlorine) and Aroclor 1254 (54 percent chlorine). (GPFOX00009240, at 243.)
145. All of the commercial mixtures of PCBs – regardless of the degree of chlorination – were composed of many different individual components. (PFOF Nos. 142-144; 146.) The toxicity of individual components was unknown at the time, and the components present in a given Aroclor mixture were poorly defined and variable. Thus, it was not known whether the most toxic congeners in Aroclor 1254 and 1260 were also present in Aroclor 1242 (the NCR product). There was no scientific basis for assuming that Aroclor 1242 would not pose risks comparable to those associated with the higher chlorinated Aroclors. (Rodricks Expert Report at 33-34.)
146. By May 14, 1953 at the latest, NCR understood that Aroclors are mixtures of chlorinated biphenyls. (NCR-FOX-0566603, at 640-641.)
147. Monsanto visited NCR Paper manufacturing facilities in 1953 and 1954 to understand the manufacturing process for NCR Paper and NCR's use of Aroclor 1242. (Dkt. 661 ¶ 13.)

148. By 1953, NCR had the technology and know-how to test samples of Aroclor in order to verify the percentage of chlorine content using methods developed by Monsanto. (NCR-FOX-0566603, at 638.) NCR scientists were able to confirm the chlorine content of samples of Aroclor 1242 and Aroclor 1254 in NCR laboratories. (NCR-FOX-0566603, at 641, 657.)
149. As a mixture, Aroclor 1242 contained every PCB homologue up to and including the higher chlorinated PCBs. (Vodden Dep., 14:15-19; Anderson Dep., 23:8-25:23.) In any of the Aroclors there were about 200 different components of different chlorine levels. (Vodden Dep., 14:20-25.)
150. The microcapsules manufactured by NCR for use in NCR Paper contained, on average, between 57 and 66 percent PCBs. (NCR-FOX-0546987, at 7125-127.)
151. NCR had a continuing working relationship with the technical departments at Monsanto. (PHGNCR-2006647.)
152. Monsanto's promotional literature from the 1940s through the 1960s emphasized the "stability" of its entire Aroclor product line and described its Aroclor products as, "chemically resistant," they do not "break down under mechanical stress," "strongly resist attack by water, acids, alkalis, and other common corrosive influences, as well as microorganism attack," and exhibit "resistance to weathering." (GPFOX00056893, at 899, 903; GPFOX000058230, at 241.)
153. PCBs are stable, not very soluble in water, very soluble in fat and nonaqueous solvents, heavier than water and adsorb to organic matter, including soil and sediment. (Anderson Dep., 11:1-112:6.) These characteristics make PCBs capable of bioaccumulation when released into the environment. (Rodricks Expert Report at 56.)
154. NCR chose PCBs for a variety of reasons: "(1) relatively low cost, (2) water insolubility, (3) good solubility of the dye in PCB, and (4) no interference of the solvent with color development of the dye." (NCR-FOX-0524621, at 624.)
155. In a 1972 internal NCR communication entitled "The Status of Polychlorinated Biphenyl Uses at NCR," Troy Hoover wrote that: "The same properties that contributed to their [PCBs'] usefulness were indited (sic) as contributing to the possible hazardous effects." (NCR-FOX-0524621, at 624.)

**D. NCR Patents Did Not Limit Manufacture of NCR Paper to Using PCBs**

156. From 1945 to 1972, NCR held over 30 patents related to the making of NCR Paper. A U.S. Patent provides a description of the invention that is claimed. (DeLaurentis Expert Report at 3-4.) The issuance of a U.S. Patent does not mean that the patented invention will ever be manufactured, marketed or sold. (*Id.*) NCR's patents did not disclose that the product marketed as NCR Paper would contain PCBs in general or Aroclor 1242 specifically. (*Id.* at 8-9.) Rather, NCR's patents simply disclosed the use of an "oily" liquid or solvent to dissolve a "color reactant." (*Id.* at 9.)

157. The Defendants did not learn of the presence of PCBs in NCR Paper from the patents for NCR Paper.
158. The defendant recycling mills were not competitors of NCR in the manufacture or sale of NCR Paper subject to any NCR patents. The recycling mills were not trying to replicate NCR Paper nor were they trying to design around NCR patents. At most, they were merely recyclers of NCR Paper.
159. Patents for NCR Paper that identify chlorinated biphenyls (or PCBs) did not identify them as potentially harmful to human health or the environment, nor did they suggest that release to the environment would cause environmental harm.
160. NCR's use of PCBs was a trade secret, not available to the public or the Defendants in this action. (API-GE033537, at [539](#); Schumaker Dep., [43:20-24](#) (PCBs in NCR Paper was a "deep, dark secret and it was protected by NCR with their lifeblood. And that's an understatement."); Stevens Dep., [45:8-15](#) ("We didn't like to give out our sources of solvents, dyes or methodology to anyone . . . [NCR] sure as hell weren't publicizing it. It was a very confidential system."); Herbig Dep., [74:19-75:7](#) ("fundamental research group "too proud" to give information regarding NCR Paper to capsular research department).)

#### **E. NCR Controlled Process for the Manufacture of NCR Paper Worldwide**

161. It was NCR policy that NCR Paper be manufactured to NCR's specifications. (BCFOX00042818, at [3353](#).)
162. In 1954, NCR issued confidential process specifications for the coating process used to manufacture NCR Paper which were provided to ACPC. (NCR-FOX-457462.) These confidential process specifications were revised by NCR periodically. (NCR-FOX-377584 (1958); NCR-FOX-352047, at [048-053](#) (1963), [054](#) (1963), [055](#) (1968).)

#### **F. NCR Trials at ACPC and Combined Locks**

163. Beginning in 1953, NCR worked with ACPC and Combined Locks on test runs to coat paper with the NCR Emulsion. (NCR-FOX-0518029, at [029-031](#); NCR-FOX-0518365, at [365-368](#); NCR-FOX-0519413, at [413-417](#).)
164. The 1953 test runs included NCR personnel making multiple visits to ACPC and Combined Locks to observe the process of coating paper with NCR Emulsion and creating rolls of NCR Paper. (See, e.g., JDGFOX00001215; BCFOX00042818, at [3388](#); NCR-FOX0519413, at [413-417](#).)
165. As a result of its coordinated activities with ACPC, Wiggins Teape Ltd. ("WT") and Combined Locks, it is reasonable to infer that NCR became aware of ACPC and Combined Locks' liquid and solid waste streams, including the creation of PCB-containing effluent waste and NCR Paper broke waste. In fact, it is clear that by 1957, NCR and WT had discussions about the expected amount of broke created as a result of the manufacture of NCR Paper. (BCFOX00042818, at [3353-356](#).)

#### **G. NCR Paper Emulsion and Capsules**

166. NCR used the Aroclor 1242 PCB mixture as a solvent to suspend dyes inside the NCR Paper microcapsules that it manufactured at facilities located in Dayton, Ohio (from approximately 1953 through 1971), Portage, Wisconsin (from approximately 1968 through 1971), and Boreham Wood, UK (from approximately 1957 through 1970). (NCR's Responses to Georgia-Pacific's First Set of Interrogatories, [No. 1.](#))
167. The microcapsules in the NCR Emulsion were designed to, and capable of, rupture, thereby releasing PCBs, via direct pressure from a ball point pen, through exposure to acids and solvents, through high temperature or pH conditions and during transport. (Herbig Dep., [237:12-241:21](#); Gordon Taylor Dep., [65:19-67:16](#); Schwab Dep., [143:14-145:24](#); Goetz Dep., [102:6-105:5](#), [156:19-157:19](#), [226:11-232:13](#), [257:24-258:6](#).)
168. NCR shipped its NCR Emulsion from the NCR Dayton Facility and the NCR Paper Capsule Facility in milk trucks. (Dkt. 659 ¶ [91](#); NCR-FOX-0524049, at [051](#).) There were incidents when milk and products made from milk hauled in these trucks also used to haul PCB emulsion became contaminated with PCBs. (Dkt. 659 ¶ [91](#); NCR-FOX-0555135.)

#### **H. Production of NCR Paper in the United States**

169. NCR licensed the production and sale of NCR Paper in the United States to Mead Corporation. (NCR's Responses to Georgia-Pacific's First Set of Interrogatories, [No. 4.](#)) ACPC was not licensed to sell NCR Paper. (Dkt. 661 ¶ [33](#).)
170. Mead Corporation made NCR Paper at its mill in Chillicothe, Ohio. (NCR's Responses to Georgia-Pacific's First Set of Interrogatories, [No. 2.](#))
171. ACPC was a NCR contract coater that made NCR Paper on the Fox River at the Appleton Facility. (Dkt. 659 ¶ [23](#).) NCR Paper was ACPC's single largest product. (APIFOX00023577, at [578](#), [585](#), [600](#).) A 1964 management consulting report prepared for ACPC states: "In effect, NCR is Appleton Coated Paper Company today, since the company owes most of its present success to that business and conversely, without NCR the Company would be unable to support its present plant and overhead structure." (APIFOX00023577, at [600](#) (emphasis in original).) Beginning just after NCR purchased the stock of Combined Locks in late 1969 and ending in 1971, NCR also produced PCB-containing NCR Paper at the Combined Locks Facility along the Lower Fox River in Combined Locks, Wisconsin. (Dkt. 659 ¶ [24](#); NCR's Responses to Georgia-Pacific's First Set of Interrogatories, [No. 2.](#))
172. NCR became the owner and operator of the Combined Locks Facility in 1969. (NCR's Responses to Glatfelter's First Set of Interrogatories, [No. 20](#); API's Responses to Glatfelter's Interrogatories, [No. 20](#).) API is the current owner or operator of the Appleton Facility. (API's Responses to Menasha Corporation's Requests for Admissions, at [4](#).)

173. NCR sold its NCR Emulsion to ACPC and Combined Locks (both NCR's predecessors). (NCR's Responses to Georgia-Pacific's First Set of Interrogatories, [No. 2](#); Strelow Dep., [116:16-117:14](#); Jezerc Dep. (April 21, 2009), [123:19-124:14](#); Goetz Dep., [38:9-24](#).) ACPC and Combined Locks would then coat the paper per NCR's confidential specifications. ([NCR-FOX-457462](#).)

#### **I. Production of NCR Paper in Europe**

174. NCR licensed the production and sale of NCR Paper in the UK to WT. (Dkt. 661 ¶ 31.) Beginning in the mid-1950s, WT sold NCR Paper in all markets other than North America and Japan.
175. NCR Research in the UK was in close alliance and communication with NCR Dayton Research and was NCR's fully informed representative in NCR's dealings with WT, although WT made direct contact with NCR Dayton as well. (BCFOX00042818, at [3353-354](#).)
176. NCR Paper was manufactured by WT at two facilities: Treforest, England, and Nivelles, Belgium, from approximately 1956-1970. (Dkt. 659 ¶ 26; Dkt. 661 ¶ 31; NCR's Responses to Georgia-Pacific's First Set of Interrogatories, [Nos. 2, 4](#); Dkt. 659 ¶ 26.) The PCB-containing NCR Emulsion used at these facilities was produced at NCR's plant in Boreham Wood, UK. (NCR's Responses to Georgia-Pacific's First Set of Interrogatories, No. 1; Dkt. 659 ¶ 22.)

#### **J. 3M Produced a Competing Carbonless Copy Paper Product without PCBs**

177. By August 1962, Minnesota Mining and Manufacturing ("3M") began manufacturing a carbonless copy paper to compete with NCR Paper. ([BCFOX00026969](#).) NCR and WT studied this 3M product beginning in 1962. According to WT in 1964, 3M's product "is undoubtedly the best self-contained paper so far produced but it does not appear yet to have been sold in any significant volume." ([BCFOX00026969](#), at [969](#).)
178. In about 1965, NCR sued 3M for patent infringement on patents related to the manufacture of NCR Paper. The patent infringement lawsuit was settled in 1965, with 3M paying royalties to NCR. ([BCFOX00006234](#), at [235](#); [BCFOX00048809](#), at [818](#).)
179. In 1965 and 1966, 3M substantially improved its carbonless copy paper product. ([BCFOX00048132](#), at [133](#).) NCR, ACPC and WT studied the competing 3M carbonless copy paper product's content and performance. ([BCFOX00007148](#), at [149](#); [BCFOX00051633](#), at [637](#); [BCFOX00007096](#).) "Everybody seems agreed that [3M's carbonless copy paper] is a superior product to NCR paper." ([BCFOX00064212](#), at [214](#).)
180. By 1965, at the latest, NCR and ACPC knew 3M's competing carbonless copy paper did not contain PCBs. ([BCFOX00006211](#), [BCFOX00006213](#), at [214](#); [BCFOX00064320](#), at [320](#); [BCFOX00051636](#), at [637](#).) In addition, 3M's solvent was "very much cheaper" than the PCBs in NCR's emulsion. ([BCFOX00006211](#), at [211](#); [BCFOX00006267](#); [BCFOX00006251](#); [BCFOX00048809](#), at [818](#).)

**VII. NCR AND ACPC KNEW THAT MANUFACTURING AND RECYCLING NCR PAPER COULD RELEASE PCBs INTO THE ENVIRONMENT**

**A. From the 1950s, NCR, ACPC and WT All Knew that NCR Paper Contained PCBs**

181. As the inventor of NCR Paper emulsion, NCR knew at least by 1953, when it began commercially producing NCR Paper, that PCBs were in the NCR Paper. (PFOF Nos. 133; 146; 148.)
182. ACPC knew NCR Paper contained PCBs at least by 1955. (APIFOX00055059, at [062-063](#).) A 1955 lab book from Tom Busch, ACPC's then Technical Director, states: "Volatilization of the active material (arachlor) resulting from rupture could be assured in the remainder of the oven before it gains contact with the clay surface and the wind-up reel." (*Id.*) Another entry on February 10, 1968, describes the NCR Paper as containing "chlorinated diphenyl 'known commercially as arachlor.'" (APIFOX00047615.)
183. Similar to ACPC, WT knew since it started making NCR Paper in the UK in 1955 that one of its ingredients was potentially toxic – the "ingredient is a chemical called Aroclor 1242." (BCFOX00004096, at [097](#).)

**B. NCR and ACPC Knew that Recycling NCR Paper Would Result in Releases of PCBs to a Waterbody and into the Lower Fox River in Particular**

184. During the Production Period, broke from NCR Paper contained PCBs known by the trade name Aroclor 1242. (Dkt. 661 ¶¶ 20, 173.)
185. From 1954 to 1971, ACPC, Combined Locks and then NCR, sold the broke from NCR Paper to recycling mills. (Dkt. 661 ¶¶ 171-172; Kresch Dep., [80:19-81:17](#); Christensen Dep., [47:5-49:19](#).)
186. Documents from WT's Butler's Court collection demonstrate that NCR knew broke was recycled beginning in 1958. (BCFOX00000564, at [564](#); *See also* PFOF Nos. 207; 209-229.) By the mid-1960s at the latest, NCR and its predecessors knew that broke from the manufacturing of NCR Paper would be recycled to recover the fiber in the paper. (Kresch Dep., [80:19-81:19](#); Christensen Dep., [47:5-15](#).)
187. In a December 1963 meeting among NCR, ACPC and WT, capsule breakage and the release of Aroclor during production of NCR Paper was specifically discussed. (BCFOX00038478, at [486](#).)
188. In 1965, NCR tested the use of repulped ("recycled") CB broke. Results revealed that the CB broke could not be recycled due to the contamination of the furnish by the capsules. Specifically, using 25% or more recycled CB broke caused a blue discoloration in the paper produced. (APIFOX00076652, at [654-655](#).)
189. By the end of 1965, ACPC already knew that the recycling of NCR Paper broke would result in the release of PCBs into the environment. (Jezerc Dep. (April 20, 2009), [77:4-](#)

80:7, 171:17-72:8.) And in 1965, WT was undertaking its testing program to remove Aroclor in broke and effluent, results of which it likely shared with NCR. (See GPFOX00030219; BCFOX00064044, at 050.)

**C. In-Depth Technical Exchanges among NCR, ACPC, and WT Included Shared Knowledge of Recycling of Broke**

190. WT was a fully integrated paper company, headquartered in the UK, which operated papermaking and recycling facilities throughout the world. (NCR's Responses to Georgia-Pacific's First Set of Interrogatories, Nos. 2, 4; GPFOX00144403, at 404.) From 1955 through the middle of 1970, WT served as a licensee for NCR in the production of PCB-containing NCR Paper within the UK and Europe. (NCR's Responses to Georgia-Pacific's First Set of Interrogatories, Nos. 2, 4.)
191. Like ACPC, WT coated paper with NCR Emulsion at facilities located in Stoneywood, England (1955–1956), Treforest, England (1956 or 1957–1970), and Nivelles, Belgium (1963 or 1964–1970). (NCR's Responses to Georgia-Pacific's First Set of Interrogatories, No. 2.)
192. The history of the NCR-WT relationship was analyzed by the United States Federal Trade Commission ("FTC") in connection with a federal antitrust complaint. (GPFOX00144403.) FTC determined that NCR and WT had a "30 year open-door technological exchange" of information, that WT had had "practically unlimited access . . . to Appleton technology." (GPFOX00144403, at 432 n. 156.)
193. ACPC and WT had complete freedom in exchanging technical information. (BCFOX00007070.)
194. The events surrounding NCR and ACPC's relationship with WT took place decades ago, and for the reasons discussed below, most of the evidence about them comes from WT's Butler's Court facility in Beaconsfield, UK, where WT Research & Development Limited operated and maintained its files. WT's Butler's Court operation was the hub of WT's contacts with both NCR and ACPC. (PFOF Nos. 203; 205-209; 217-219; 221-231; 234-242.)
195. In a number of discovery meet and confers conducted in 2009, Defendants identified significant gaps in routine periodic reports that had been historically prepared by NCR employees, including internal monthly reports prepared by a number of NCR's Research & Development Division departments that had responsibility for NCR Paper production and improvement. (Dkt. 425-14.) NCR asserted that it had conducted a diligent search of relevant document repositories, and that such documents either did not exist, had been transferred to Appleton Papers, Inc., or had been destroyed in the normal course of business. (Dkt. 438-7.)
196. For approximately one year, Defendants also sought from Plaintiffs documents which Defendants believed would have key information relevant to Phase I, including documents related to PCB usage and analysis and broke recycling efforts produced by or concerning WT, British American Tobacco ("BAT") and NCR's Boreham Wood, UK

emulsion production facility. Georgia-Pacific initially served its document request on API on December 19, 2008. (Dkt. 425-15.) Georgia-Pacific then sent a letter to NCR on March 2, 2009 regarding documents located in Beaconsfield, UK, at WT's Butler's Court facility, and forwarded that letter and its exhibits to API in a March 26, 2009 letter that again demanded production of Butler's Court documents. (Dkt. 425-14; Dkt. 425-17.)

197. In April 2009, Georgia-Pacific heard a report that WT's Butler's Court operations were moving from the UK to Belgium, and that historic documents maintained at Butler's Court might be destroyed. (Dkt. 425-19.) Georgia-Pacific immediately asked API for confirmation that those files were on litigation hold and being preserved. (Dkt. 425-19.) Instead of making any effort to preserve the documents, API instead claimed on April 10, 2009 that it had no legal obligation to preserve or produce Butler's Court documents. (Dkt. 425-20.) API also informed Georgia-Pacific that it did not intend to search its former parent company's (AWA) files for responsive documents and refused to confirm whether API had searched several of its own facilities for responsive documents. (Dkt. 425-25.)
198. API did produce some NCR monthly reports not produced by NCR, but significant gaps in the historic files maintained by ACPC, Appleton Papers, Inc. and NCR remained. Nevertheless, API refused to produce a witness for deposition to testify regarding "the searching and identifying process for the documents produced." (Dkt. 425-24.)
199. Georgia-Pacific then filed a motion to compel production of these documents on April 17, 2009. (Dkt. 423.)
200. During interviews with former WT employees in the UK on April 30, 2009, Georgia-Pacific confirmed that all hard copy files at WT Butler's Court had been destroyed, most likely just weeks before (in early April 2009), and that the hard copy files likely contained more materials than had been preserved on microfiche files that were still present at Butler's Court and contained significant historical technical documents. (Dkt. 431 ¶ 5.)
201. Ultimately, on July 31, 2009, the Court granted Georgia-Pacific's motion to compel production of the WT Butler's Court documents. (Dkt. 507.)
202. For the most part, the documents produced from WT's Butler's Court constitute the only evidence of the detailed technical exchanges, including technical exchanges regarding surviving broke recycling and PCB usage that occurred between and among ACPC, NCR and WT during the Production Period.
203. Based on these documents alone, over sixty-five meetings were held between 1953 and 1971 involving all or some of the following parties: NCR, ACPC, WT and other licensees or contractors such as Mead and Combined Locks. (BCFOX00037518, at 523; JDGFOX00001215; BCFOX00026313; BCFOX00042818, at 3367, 3353, 3364, 3419; BCFOX00042681; BCFOX00042696; BCFOX00057891; BCFOX00044655, at 695; BCFOX00042730; BCFOX00044655; BCFOX00037718; BCFOX00057951; BCFOX00038248, at 249; BCFOX00038084, at 138; BCFOX00026969;

BCFOX00047191; BCFOX00047198; BCFOX00029990; BCFOX00029978;  
 BCFOX00047210; BCFOX00026911; BCFOX00026989; BCFOX00039015;  
 BCFOX00039067; BCFOX00047449; BCFOX00047513; BCFOX00047507;  
 BCFOX00039125; BCFOX00007071; BCFOX00047556; BCFOX00048809;  
 BCFOX00048825; BCFOX00023159; BCFOX00032505; BCFOX00048862;  
 BCFOX00039527; BCFOX00039543; BCFOX00027298; GPFOX00030347;  
 BCFOX00039767; BCFOX00039755; BCFOX00039776; BCFOX00027350;  
 BCFOX00027348; BCFOX00030049, at 064; BCFOX00027538; BCFOX00057484;  
 BCFOX00049282; BCFOX00029305; BCFOX00057627; BCFOX00057636;  
 BCFOX00057645; BCFOX00032530; NCR-FOX-0528918; BCFOX00027910, at 911;  
 BCFOX00050026; BCFOX00050071; BCFOX00051277.)

204. In 1964, NCR and WT increased their technical cooperation and that cooperation continued well into the 1970s. (NCR-FOX-445514, at 521.) Minutes of the NCR-WT technical meetings were prepared by NCR. (*Id.*) The technical exchange program between NCR and its licensees, ACPC and WT, continued into the 1970s and included monthly progress reports, visits to NCR, ACPC and WT facilities and meetings involving senior scientists at WT and NCR. (NCR-FOX-445437; NCR-FOX-478261.) As part of this exchange, WT and NCR exchanged periodic comprehensive reports that detailed various aspects of NCR paper development. (BCFOX00063228; BCFOX00006714.)
205. Starting even before 1964, one of the technical issues periodically discussed by NCR, WT and ACPC was the recycling (re-use) of NCR Paper broke. (BCFOX0042818, at 43356 (1957); BCFOX00000564, at 564 (1958); BCFOX00044655, at 699 (1959) BCFOX00006199, at 200 (1965); BCFOX00007658, at 660 (1966); BCFOX00007218 (1966).)
206. In July 1957, WT was keenly interested in broke recycling, raised the matter with NCR, and reported that “[ACPC] are supposed to be giving us their figures for broke but the meeting agreed that in any case we need a full broke investigation, and Mr. Hendry undertook to put one of [the WT] Group Research staff on to it.” (BCFOX00029188.)
207. On January 7, 1958, NCR wrote to WT and explained that: “[NCR] discussed the problem of reuse of wastepaper containing NCR CB and CFB [*i.e.*, the sheets that contain PCBs] with the personnel of both the Mead Corporation and the Appleton Coated Paper Company. It [was NCR’s] understanding that neither mill reprocesses their own NCR Paper waste but that they sell it to other paper making firms who re-use it in fairly high grade papers. The personnel of both mills have promised to write [WT] directly to give you details and their recommendations. [NCR’s] own experiments in our laboratory indicate that no problem is encountered in reusing CF or CFB by itself. If CF and CB are mixed or there is CFB present, the reaction of the dye and clay will turn the pulp blue. If the pulp is well dispersed the final sheet will have a uniform blue tint. This blue color is easily reduced and if washed away will cause no difficulty.” (BCFOX00000561, at 561.) WT told NCR that reports from Mead were contrary to NCR’s statement that the blue color “will cause no difficulty,” saying to NCR that “it is extremely difficult to remove the blue colour.” (BCFOX00000564, at 564.)

208. In March or April of 1959, WT and NCR met and discussed emulsion consumption and broke levels. (BCFOX00044655, at 699.) NCR confirmed the figures for emulsion consumption and broke at mills making NCR Paper in the United States. (*Id.*) Howard Lauer of NCR asked WT to “supply monthly figures for CB and CFB [paper coated with NCR Emulsion] production related to emulsion consumption.” (*Id.*)
209. During WT and NCR’s December 1963 visit to ACPC, WT discussed with NCR’s Howard Lauer and ACPC’s Tom Busch (President and Technical Director) issues relating to CB Cheque Paper. They discussed how “capsule breakage leads to release of the oil (Arachlor).” (BCFOX00038478, at 485.)
210. In the later part of 1964, WT became interested in recycling its own broke. (Dkt. 659 ¶ 41.) As a result of the research it conducted, WT built its own broke recycling plant, hoping to achieve results similar to those achieved in the recycling experiments conducted by WT and BAT. (Dkt. 661 ¶ 163; Gough Dep., 66:1-10, 100:24-101:16.) The goal of WT’s recycling mill was to remove as much of the inks (which contained PCBs) from the NCR Paper, and ensure that those inks and Aroclors were discharged either to the river or to sludge and not to the recycled products. (Dkt. 661 ¶ 164; Gough Dep., 73:7-74:1, 97:19-99:3.)
211. WT’s broke recycling testing program had laboratory support from BAT, WT’s then part-owner. (Dkt. 659 ¶ 43.) Monsanto provided input on analytic techniques to assist WT in its testing. (*Id.*) The results of this program revealed the presence of PCBs in broke, paper products made from recycled broke, and the waste water generated during the recycling process. (*Id.*)
212. In 1964, WT made attempts to use CF and CB NCR Paper broke in various WT Group mills. (BCFOX0047151, at 151.)
213. In October 1964, the results of PCB testing at WT revealed the presence of PCBs in all media sampled, including NCR Paper broke, paper products made from recycled broke and the waste water generated from the recycling process. (GPFOX00030165, at 165-166.)
214. WT decided to expand its broke recycling efforts. On November 4, 1964, representatives of WT met with representatives of Research and Development Establishment of BAT. (GPFOX00030175.) BAT and WT had a prior business relationship as a result of a joint venture which produced paper for cigarettes. BAT had superior laboratory capability, and WT asked BAT if it could determine the amount of Aroclor in NCR Paper and recycled broke products. (*Id.*)
215. According to a November 5, 1964 BAT Memorandum, WT “explained the reason for their interest in Aroclor; it is present in the emulsion used to coat NCR Paper. In the production of NCR Paper there is a very large amount of waste which is repulped and used to make other types of papers. Aroclor, a chlorinated diphenyl, is toxic and so it is necessary to know how much is removed during the repulping process especially if the paper is to be used for food wrapping.” (GPFOX00030175.)

216. On December 8, 1964, NCR and WT met and noted that: “One point which must be cleared up, is whether broke CF using phenolic resin can be repulped.” (BCFOX00026939, at 941.)
217. In 1965, WT’s Butler’s Court research group began its extensive broke recycling testing program. (Dkt. 659 ¶ 42.) This included recycling of CB, CFB, as well as a new type of CF made with a phenolic resin instead of clay.
218. On January 5, 1965, Howard Lauer of NCR wrote to Clive Capps of WT: “Regarding your question also in the 14 December letter, about Phenolic CF, our people [NCR] have discussed the repulpability of Phenolic CF in detail with Dr. Strauss of Nekoosa-Edwards. Nekoosa has repulped paper produced in many trials to date. No problems were anticipated, nor have they occurred. Of course, to date that amount of Phenolic CF fed in are small; and for future, Nekoosa anticipates that the percent of ‘Phenolic CF in’ would always be less than 15% of the total pulp being worked.” (BCFOX00006199, at 200.)
219. On February 22, 1965, WT spent four days at NCR-Dayton (from February 22 to 25) with NCR discussing many different aspects of NCR Paper production and sales. WT “stressed the importance of close co-operation between Dayton and W.T.” regarding changes to phenolic CF. Tavener (of NCR) “agreed wholeheartedly.” NCR supplied clay to WT to improve resistance to desensitization. (BCFOX00039067, at 075-076; NCR-FOX-478261, at 263.)
220. WT had samples of tissue paper made both with and without NCR Paper broke sent to BAT for analysis beginning on March 16, 1965. (GPFOX00030218.) BAT determined there was Aroclor ranging from 0.1 percent to 1.5 percent in all the samples sent by WT on March 16, 1965. (GPFOX00030219.)
221. In April 1965, NCR and WT met as a part of their technical exchange. (BCFOX0047465.) One of the topics of discussion was recycling NCR Paper. (*Id.* at 467, 488-489.) At the April 1965 meeting, NCR told WT that it knew that “the best method of approach is to adsorb oil [Aroclor] on to clay and wash out the latter.” (*Id.* at 467.) NCR knew that Mead had “a deinking process for recovery of NCR broke.” (*Id.* at 488.) WT wanted NCR to consider using oil lighter than Aroclor in the emulsion capsules to facilitate recycling, but NCR refused. (*Id.* at 489.)
222. During the April 1965 visit, WT and NCR also discussed the “reuse of paper machine broke containing emulsion and the problem which will arise if emulsion gets into the backwater.” NCR told WT that NCR has “been looking for an alternative to Aroclor for the last ten years without success. They were looking for improvements in toxicity, odour, and cost.” (BCFOX0047465, at 489 (emphasis added).)
223. By April 1965, the amount of broke created during the manufacture of NCR Paper was one of the factors NCR and WT used to estimate the amount of emulsion needed for a given tonnage of NCR Paper. (BCFOX0047465, at 489.) WT calculated the amount of

emulsion at given percentages of broke. (BCFOX0047465, at 506.) For ACPC, NCR and WT, emulsion was being lost in the broke waste and that affected profits.

224. On May 17, 1965, WT visited Mead, as arranged by Howard Lauer of NCR Dayton. WT reported that Mead “do not use their NCR broke but sell it to Moraine . . . for about \$50 per ton.” (BCFOX00039114, at 120.)
225. On May 19, 1965, WT visited ACPC primarily to study ACPC’s new coating machine. The report states: “many previous visits have been made by Wiggins Teape personnel, and there are very few stones unturned.” (BCFOX00039129, at 130.)
226. On May 20, 1965, WT visited Combined Locks. ACPC arranged this visit. Combined Locks does not divulge their technique “to the same extent of other N.C.R. producers.” (BCFOX00039125, at 126.)
227. On June 11, 1965, WT had an internal meeting about the possible re-use of NCR broke described as follows in WT documents: “Mr. Gough gave the meeting a brief talk, illustrated by diagrams and samples, on the recent work he had been doing on the recovery of usable fiber from NCR broke. He discussed the quantities of this broke arising (and likely to arise in the future), the previous attempts by Treforest and Nivelles and Dorried of Duren to bleach it, the mechanism of capsule separation with or without rupture, and the special problem posed by the arochlor (which, being toxic, must be removed if the broke is to be reused in papers likely to come into contact with food, and which is virtually impossible to destroy chemical).” (BCFOX00064044, at 050 (emphasis added).)
228. On July 19 and 20, 1965, WT ran a large-scale trial of NCR Paper broke re-use at its Thomas Owen and Company Limited mill, in Ely, Cardiff, UK (“Ely Paper Works”). (BCFOX00057271, at 272-273.) This longer trial had two main objectives: “1. To study the effect of prolonged running on the quality of the accepted stock. (Reed’s find that the quality of their de-inked stock deteriorates during a prolonged run, due to the build-up of the ink, etc. in the backwater. We therefore wanted to see whether the same effect is apparent when treating N.C.R. broke). 2. To produce treated N.C.R. broke which could be added to the furnish of the Base paper for N.C.R. C.F.B. coating. This would show whether N.C.R. broke, after flotation, could be re-used in N.C.R. Base.” (*Id.* at 272.)
229. In August 1965, WT ran another NCR Paper broke re-use trial at WT Group’s Ely Paper Works. (BCFOX00023015, at 016.) C.W. Paradise of Ely Paper Works recommended lab work be done as a result of this trial to determine if another trial should be run “to see if further reduction in arachlor content is possible.” (*Id.* at 017.)
230. On August 4, 1965, WT reported the results of a PCB investigation stating that PCBs were found in NCR Paper broke, paper made from NCR Paper broke and backwater by WT, some one hundred times greater than the previous values. (GPFOX00030288.)
231. In August 1965, NCR visited WT and NCR facilities in the UK and Europe from July 19-August 6, 1965. NCR’s objectives for the meeting included: “closer liaison, both technical and concerning policies.” (BCFOX0001059; NCR-FOX-445869, at 871.)

232. On September 14, 1965, Mr. Gough of WT wrote a report on re-use of emulsion-coated NCR Paper broke which provides a detailed description of all WT efforts, including the flotation deinking trials on NCR Paper broke. ([BCFOX00057271](#).) During these flotation trials, it was shown that “most of the N.C.R. coating materials in the broke were removed” and the “Aroclor content was reduced from 1.9% to 0.15%.” (*Id.* at [275](#).)
233. On October 15, 1965, on behalf of WT, C.W. Paradise of Ely Paper Works sent BAT eight samples of backwater from a recent trial. WT asked BAT to “carry out quantitative determinations.” ([GPFOX00030296](#).) All of the samples sent to BAT on October 15 1965 contained Aroclor. ([GPFOX00030297](#).)
234. On November 3 and 4, 1965, WT visited NCR and ACPC in New York. Discussions centered on phenolic CF development. Appleton was doing trials and was getting ready to make their own CF. ([BCFOX00047556](#).)
235. On November 17, 1965, WT sent BAT samples taken from a pulper, accepted stock and backwater. ([GPFOX00030299](#).) BAT determined all of the samples contained Aroclor. ([GPFOX00030300-303](#), at [301-303](#).)
236. On December 2, 1965, WT sent BAT a recycled broke project which contained 30% reclaimed NCR broke for analysis. ([GPFOX00145034](#).) All of these samples were determined by BAT to contain Aroclor. ([GPFOX00030306](#).) Given the extensive, on-going correspondence and meetings, including discussions of NCR Paper broke recycling, it is reasonable to infer that the results of WT’s PCB broke investigations were shared with NCR and ACPC.
237. On December 5, 1965, WT visited Mead. They discussed the volume of NCR business, NCR coating plant, phenolic CF, and broke. WT stated, “They do not re-use any of their broke.” All broke is sold at \$50 per ton to Moraine Paper Mills at Dayton. ([BCFOX0048796](#), at [801](#).)
238. On December 15, 1965, WT spent two weeks visiting NCR in Dayton, ACPC, Mead, Nekoosa, Minerals and Chemicals, and Union Processing regarding NCR Paper. “A significant amount of time” was spent with WT, both in Dayton and at the mills. WT and NCR had detailed discussions of various technical issues. Appleton has about 58% of NCR sales. ([BCFOX00048809](#), at [811](#).)
239. On February 3, 1966, NCR visited WT as part of the technical exchange program. They discussed NCR Paper production and quality. ([NCR-FOX-318380](#), at [389](#).)
240. On February 9, 1966, WT Research and Development Limited recommended against bleaching and deinking NCR Paper broke on economic grounds – WT already was using untreated “white emulsion broke” satisfactorily at WT Group’s New Bury, Bridgend and Monmouthshire Board mills. ([BCFOX0027237](#), at [240](#).) The “white emulsion broke” was PCB-coated CB and CFB broke from WT’s Treforest mill. ([BCFOX00057352](#), at [352](#).) WT’s approach to using the “white emulsion broke” was “to include the broke in papers where the smell and colour could be tolerated.” (*Id.*)

241. On February 14, 1966, John Gough of WT wrote a report about the limitations on the use of the white emulsion broke from WT's Treforest mill:

The principal problem occurs with the broke from Treforest. The C.F. coated broke produced by Ely can be used unchanged into the N.C.R. furnish, provided the percentage is kept below 25%. The Treforest broke (C.B. and C.F.B.) contains Aroclor, a toxic and odourous solvent, gelatin, and the N.C.R. drystuffs. Aroclor is a cumulative poison and must be kept out of all food wrapping paper. The C.B. dyes and the C.F. become intimately mixed on repulping the broke and produce blue paper.

(BCFOX00057352, at [352](#).)

242. In 1966, WT discussed its trial runs for recycling NCR Paper broke and removal of Aroclor with NCR because a replacement solvent for Aroclor, HB-40, was being evaluated by NCR which would make re-use of the colored NCR Paper broke possible. (BCFOX00007658, at [660](#); [BCFOX00007218](#).)
243. Considering the close working relationship between WT and NCR, it is reasonable to infer that WT discussed its broke research findings with NCR.

**D. NCR and ACPC Knew an Increasing Amount about the Risks Associated with PCBs**

244. Before 1971, the studies on PCBs, and the dangers reported about them, were widely recognized in the industries that used PCBs in their products. Except for manufacturers of NCR Paper (ACPC, Combined Locks, Mead, WT, etc.), the paper industry did not use PCBs in their paper products. (NCR-FOX-0159624, at [625](#).)
245. When NCR first began manufacturing its NCR Emulsion, and throughout the 1960s, there was a steady accumulation of scientific understanding of the risks to human health and the environment associated with PCBs. (See Dkt. 659 ¶¶ [48-49](#), [51](#), [66](#); Rodricks Expert Report at [7](#).) During this same time period, NCR, and its predecessors and licensees, gained increasing knowledge of how the recycling of PCB-containing NCR Paper would result in such risks. (*Id.*) During this same period, knowledge of how the recycling of NCR Paper would result in such risks gradually increased, and evidence of risk became clear by 1967. NCR was fully aware of this accumulating knowledge, and was also aware that evidence of this risk continued to increase after 1967, including throughout the period that NCR sought an alternative solvent for use in its NCR Emulsion. (Rodricks Expert Report at [56](#).)
246. The properties of PCBs that make them good for use in NCR Paper make them bad for the environment. (See, e.g., GPFOX00056893, at [895](#), [899](#), [903](#); Anderson Dep., [111:1-112:6](#); NCR-FOX-0524622, at [624](#) ("The same properties that contributed to their (PCBs) usefulness were indited (sic) as contributing to the possible hazardous effects.").)
247. PCBs have structural similarities to other persistent, chlorinated chemicals, such as DDT. (BCFOX00004096, at [100](#).) The presence of chlorine-carbon bonds, especially those in

which the carbon atom is part of a so-called aromatic ring, contributes to the high chemical stability of these substances, and therefore environmental persistence. (Rodricks Expert Report at 30; Stutz Dep. (June 18, 2009), 82:3-83:18.)

248. NCR studied encapsulating both DDT and PCBs. (Dkt. 659 ¶ 39; Herbig Dep., 173:7-12; Stutz Dep. (June 18, 2009), 81:3-83:19.)
249. The evolving and substantial body of work on environmental risks posed by DDT provided a signal by the early 1960s that similar risks might also be posed by PCBs. (BCFOX00004096, at 100-101; Rodricks Expert Report at 30; Stutz Dep. (June 18, 2009), 82:3-83:18.)
250. Among the various reasons NCR selected PCBs as its internal phase solvent was because PCBs are largely insoluble in water and resistant to chemical breakdown. (NCR-FOX-0524622, at 624.)
251. There was ample evidence in the publicly available scientific literature of the toxic effects of PCBs by 1953, when NCR applied for its patent for NCR Paper. (*See, e.g.*, MONSFOX00076299; JDGFOX00000863; JDGFOX00000873; JDGFOX00000836; NCR-FOX-316565.) It is reasonable to conclude that a sophisticated technology company like NCR was aware of this literature.
252. Shortly after the commercialization of PCBs in 1930, reports began to appear in the scientific literature of cases of poisoning of workers involved in PCB manufacture and use. (*See, e.g.*, PFOF Nos. 253-257.) Animal studies regarding the effects of PCBs administered by inhalation, ingestion and subcutaneous injection, documented severe skin lesions in workers (chloracne - an acne-like eruption of blackheads, cysts, and pustules) and significant liver damage. (*See, e.g.*, PFOF Nos. 256; 262.) NCR should have been aware of these studies.
253. A study published in the Archives of Dermatology and Syphilology in 1936 clearly attributed several cases of chloracne to exposure to PCBs. This study followed twenty-four men working in production of PCBs, twenty-three of whom experienced chloracne during the time of the study from 1932 to 1933. (JDGFOX00000724.)
254. In 1937, a scientific study concluded there was “no doubt as to the possibility of systemic effects from [PCBs].” (JDGFOX00000739, at 754.)
255. In 1937, Monsanto, the only United States-based manufacturer of PCBs, and NCR’s supplier, also knew of the toxic effects of PCBs. “Experimental work in animals shows that prolonged exposure to Aroclor vapors evolved at high temperatures or by repeated oral ingestion will lead to system toxic effects . . . . Repeated bodily contact with the liquid Aroclors may lead to an acne-form skin eruption . . . .” (MONSFOX00016854.)
256. In 1938 the Journal of Industrial Hygiene and Toxicology published an article concluding that a class of compounds including PCBs “are capable of producing marked liver damage in the white rat” and that “the characteristics of the liver lesions resulting from comparable amounts of any given compound are the same, regardless of the method of

administration (inhalation, feeding, or subcutaneous injection).” (JDGFOX00000768, at 790.) “Of the various chlorinated hydrocarbons tested, chlorinated diphenyl [PCBs] gave evidence of being the most toxic . . . [PCB] appears to be the most injurious compound of all those tested.” (*Id.* at 792, 794.)

257. In 1939, an article published in the Journal of Industrial Hygiene and Toxicology noted that chloracne from exposure to PCBs had been widely recognized since PCBs were first produced in approximately 1914 and reviewed the medical history and autopsies of three workers who died of liver necrosis after handling PCBs. (JDGFOX00000796.)
258. By the 1940s, more skin and liver problems had been observed in electricians and factory workers exposed to products that contained PCBs. (JDGFOX00000822; JDGFOX00000828; JDGFOX00000836.)
259. These early studies, published in the open scientific literature prior to NCR’s first patent for NCR Paper, provided a clear indication that PCBs, including the Aroclor 1242 PCB mixture used by NCR, were potentially hazardous and that care needed to be taken to prevent exposure of humans, animals or environmental media. (Rodricks Expert Report at 31, citing JDGFOX00000836; MONSFOX00031861.)
260. In 1943, a scientific article published in the trade journal The Rubber Age recounted the “serious systemic effects” from exposure to PCBs and Aroclors and noted that “[d]uring the past year many cases of skin eruption and in addition six fatal cases of a peculiar type of subacute yellow atrophy of the liver have occurred among the workers in two wire and cable mills.” (JDGFOX00000828, at 829.) It also plainly states that “[e]very one agrees that definite systemic effects can occur from inhaling or ingesting these toxic substances,” and that liver damage can be caused solely by absorption of PCBs through the skin. (*Id.* at 835.)
261. Also in 1943, the New York State Journal of Medicine published an article which stated with regard to PCB exposure: “Some workers engaged in coating wires and condensers with it have reported to have died of yellow atrophy of the liver.” (JDGFOX00000836 at 837.) This article also stated that the class of chemicals including PCBs are “[t]he most potent of these chemicals, as far as their acne-forming properties are concerned” and that “[e]very worker sufficiently exposed to [PCBs] for a few months will develop acne-like lesions on the exposed parts unless the most stringent rules of cleanliness for clothes and body are observed.” (*Id.*)
262. On August 18, 1944, a scientific study published in the journal Public Health Reports exposed rabbits, rats and guinea pigs to an Aroclor 1242 PCB mixture, the same mixture used by NCR in its NCR Paper, via subcutaneous injection, ingestion and corneal injection. (MONSFOX00076299, at 301.) The study concluded that the Aroclor 1242 PCB mixture produces pathological changes in animals. (MONSFOX00076299, at 308-309.) NCR knew about this study. (Anderson Dep., 125:20-129:6 (“but at that time the Miller work was available and there’d been case reports. So I suspect that this is why [NCR] started investigating what levels might be safe for their workers and end-users”).)

263. In October 1944, Monsanto published a “Salesman’s Manual” for Aroclor which discussed toxicity for all Aroclors, including Aroclor 1242 as follows: “TOXICITY All chlorinated hydrocarbons have measurable degrees of toxicity to the animal organisms. Aroclors are no exception,” and goes on to list the symptoms of Aroclor poisoning, including chlor-acne and acute yellow atrophy of the liver. (MONSFOX00092612, at [616-617](#).)
264. In 1947, the trade journal *The Chemist Analyst*, published by J.T. Baker Chemical Company, warned chemists working with Aroclors to take precautions because “the toxicity of these compounds has been repeatedly demonstrated, both from the standpoint of their absorption from the inspired air as well as from their effect in producing a serious and disfiguring dermatitis when allowed to remain in contact with the skin.” (JDGFOX00000863, at [866](#).) The author of this study concluded that “There is a need to give a warning.” (*Id.*)
265. A November 3, 1949 internal memorandum from NCR discusses the toxicity of PCBs (chlorinated diphenyl) stating that it is known that the substance “is toxic and should not be taken internally.” (NCR-FOX-316565 (emphasis added).)
266. A 1950 study on the toxic properties of PCBs in *The Chemistry of Industrial Toxicology* provides the following summary: “Harmful Effects: Irritation, liver damage . . . . Degree: Can be serious . . . . Toxicity is not clearly related to the degree of chlorination.” (JDGFOX00000873, at [917](#) (emphasis added).)
267. On November 16, 1953, a meeting of NCR’s Impact Paper organization and persons associated with the development of NCR’s microencapsulation technology for NCR Paper discussed “the problem of releasing information to Monsanto to study the toxicity of Aroclor. There could be legal complications . . . .” (NCR-FOX-0521952.) The NCR scientists that developed the NCR Paper technology were aware of the need to investigate the toxicity of Aroclor 1242. (*Id.*)
268. The following month, on December 11, 1953, Scientific Associates of St. Louis, Missouri, under contract by Monsanto, determined that “The [Acute Oral Toxicity of Aroclor 1242] was calculated to be 4.15 milliliters per kilogram with fiducial limits of 4.02 – 4.36 milliliters per kilogram. Survival time for those animals receiving a lethal dose varied from 12-54 hours.” (MONSFOX00037889, at [891](#).)
269. By the time that NCR applied for its first U.S. Patent for NCR Paper in 1953, it knew that PCBs were chemically stable, hydrophobic and soluble in oils/fats. The chemical characteristics of PCBs cause these compounds to bioaccumulate in animals, including humans. (Rodricks Expert Report at [30-31](#); JDGFOX00000836; MONSFOX00031861; JDGFOX00000873.)
270. In 1954, NCR’s Research Safety Committee embarked upon a program to coordinate with NCR’s Medical Department and other outside companies about laboratory safety. (NCR-FOX-421313.) As part of the effort, NCR contacted numerous companies about their laboratory safety programs, including Monsanto. (NCR-FOX-421311, at [312](#).) At

that time, Monsanto was recommending that companies using Aroclor provide exhaust ventilation to mitigate against liver damage from inhalation of the toxic fumes. (MONSFOX00095162.)

271. On June 22, 1954, NCR Research Safety Committee member, L.J. Hibbert, noted that Aroclor 1242 was a “Class 3 (very toxic)” chemical. (APIFOX00039895, at 897.)
272. On July 29, 1954, R.F. Moore of NCR’s Research Safety Committee concluded that “Arochlor 1242 as used in the Manufacturing Laboratory is toxic, and proper ventilation and personal protective equipment must be supplied.” (APIFOX00039895, at 898.)
273. In 1955, NCR’s licensee WT learned that PCBs, specifically the Aroclor 1242 mixture, was potentially toxic. (BCFOX00004096, at 097.) WT later called Aroclor 1242 a “sleeping tiger” because of its known toxic properties. (*Id.* at 097-098.)
274. By April 1955, Monsanto had designated the building where Aroclor 1242 was manufactured a “toxic department.” (MONSFOX00046290, at 481.) Packages leaving the plant bore warning labels “calling attention to possible toxic effects.” (*Id.* at 482.) Studies were underway at Kettering Laboratories in Cincinnati, Ohio to determine the safe limit of Aroclor vapors in a work environment. (*Id.*)
275. Starting no later than 1955, NCR conducted numerous studies on the acute toxicity of NCR Paper through contact with the skin. (APIFOX00013462, at 464-465.)
276. On May 27, 1955, NCR scientists Barrett K. Green and M.J. Cormack visited the Kettering Laboratories and met with Dr. Joseph Treon, who conducted animal inhalation toxicity testing on Aroclor 1242 for Monsanto. NCR concluded, based upon Dr. Treon’s work, that “[t]he death of one out of three animals resulting from the flooding of abraded skin with Aroclor 1248 for twenty-four hours must be considered significant. It could indicate some danger associated with adsorption through the skin, particularly through cuts.” (APIFOX00032862, at 865.) NCR also determined that the toxic effects of the Aroclor 1242 NCR Internal Phase used to manufacture NCR Paper, when applied to and absorbed by the skin, should be investigated. (*Id.*)
277. In June 1955, an NCR customer notified NCR that office workers using NCR Paper forms had developed skin “irritation from the chemicals in the paper” and reminded NCR that it had assured the customer that none of the chemicals used in NCR Paper were toxic. (APIFOX00023575.)
278. By December 1955, the toxicity studies performed for NCR by Hill Top determined that exposure to Aroclor 1242 created a risk of liver damage in rabbits. (APIFOX00013488, at 499-503; NCR-FOX-0521464, at 474-478.)
279. As early as 1955, NCR began looking for an alternative to PCBs for several reasons, including toxicity. (BCFOX00047465, at 489.)
280. Through 1958, Hill Top continued to perform various acute toxicity testing. During the period 1955 to 1958, NCR never performed any testing on chronic toxicity of Aroclor

- 1242, i.e., whether exposure to doses of Aroclor 1242 over an extended period of time posed a risk of injury, illness or death. (See, e.g., JDGFOX00000863, at 866; MONSFOX00076299, at 300-309; JDGFOX00000873, at 917; JDGFOX00000836, at 837; APIFOX00013488, at 499-503.)
281. By the 1960s, at the latest, NCR had a large amount of information available to it regarding the toxic and otherwise harmful properties of PCBs, including published scientific studies, Monsanto's internal work, and NCR's own internal work. (Anderson Dep., 128:9-129:6; see also JDGFOX00000863, at 866; MONSFOX00076299, at 300-309; JDGFOX00000873, at 917; JDGFOX00000836, at 837; APIFOX00013488, at 499-503; NCR-FOX-0519970, at 978.)
  282. By September 1960, NCR adopted Process Specification No. 730-53 for preparation of emulsion for NCR Paper which expresses a concern with breathing Aroclor: "Turn on south exhaust fan (avoid breathing fumes and skin contact with the Aroclor or the Internal Phase)." (NCR-FOX-0547322, at 323.)
  283. NCR's concern about breathing Aroclor was repeated in subsequent Process Specifications for emulsion for NCR Paper through at least June 1970. (See, e.g., NCR-FOX-0540452, at 453-454; NCR-FOX-0547497, at 498; NCR-FOX-0547510, at 511; NCR-FOX-0540597, at 599; NCR-FOX-0547125, at 126; and, NCR-FOX-0547150, at 151.)
  284. A Hill Top written communication to NCR about a "Safety test" dated July 8, 1961, again expresses concern about liver toxicity and skin toxicity: "It is my opinion that there are appreciable pathologic changes in the skin and livers of the higher numbered animals. . . . The skins in these cases show degenerative changes. The somewhat erratic pattern is confusing, but it would seem that whatever product is being used is toxic to skin and liver." (HillTop00000210.)
  285. In 1962, E.L. McCune, J.E. Savage and B.L. O'Dell published a study, *Hydropicardium and Ascites in Chicks Fed a Chlorinated Hydrocarbon*, which concluded that "the major toxic agent was [PCB]." (MONSFOX00096084, at 085, 088.) This study specifically used Aroclor 1242. (*Id.* at 085.)
  286. By the time Rachel Carson's influential book, *Silent Spring*, was published in 1962, and brought public attention to the widespread use and harmful ecological effects of DDT, there was substantial scientific understanding of the types of properties – toxicity, mechanisms whereby releases to the environment can occur, chemical stability, and fat solubility – that would cause a chemical to be considered a potential threat or pose a risk to human health and the environment. (NCR-FOX-350912, at 916; JDGFOX00000724, at 726-738; JDGFOX00000739; JDGFOX00000828, at 829, 835; MONSFOX00092612, at 616; Rodricks Expert Report at 6.)
  287. In 1963 and 1964, NCR and its licensees, including WT, were receiving complaints from customers over the "CF intensity" of NCR Paper. ("CF" is the coated front where duplicate images are made.) (NCR-FOX-478261, at 262.) As a result, NCR undertook

research efforts to improve the product. Monthly reports were made by NCR to WT “of the progress and developments achieved by Chemical Research on new and improved NCR Paper® systems.” (NCR-FOX-478261, at 263.) WT personnel also spent up to four days at NCR’s Dayton facility discussing “many different aspects of NCR Paper® production and sales.” (*Id.*)

288. In 1965, NCR asked Monsanto for toxicity information on Aroclor 1242 and 1254 and began searching for a PCB replacement. (Dkt. 659 ¶ 47; NCR-FOX-478261, at 266; NCR-FOX-332188, at 201; NCR-FOX-0517835.)
289. In March of 1965, toxicity remained a factor in searching for a replacement for aroclor. The “possibility of replacing aroclor in our standard CB coating with a new solvent is being studied presently in Fundamental Research. The new solvents under consideration are Shell Cyclosol # 63 and # 73. They both have the advantage of possibly being able to offer significant cost reductions and of being less odorous and irritating. However, they are slightly more volatile and have toxicities roughly equivalent to aroclor.” (NCR-FOX-478261, at 266 (emphasis added).) As of this time, only one-third of the PCBs ever used by NCR had been purchased. (GLTFOX00001900, at 901.)
290. On December 30, 1965, Monsanto sent NCR available toxicity information on Aroclor 1242: (a) Oral Toxicity for Rats – after exposure to Aroclor, rats died in 1 to 3 days. The toxic signs were diarrhea, loss of appetite, increasing weakness, dyspnea and collapse. An autopsy revealed liver and kidney damage. (b) Skin Absorbs for Rabbits – after exposure to Aroclor, rabbits died in four to ten days. Toxic signs were poor appetite with marked weight loss, occasional squealing after several days, and collapse. An autopsy revealed liver damage. (c) A copy of the publication “The Toxicity of the Vapors of Aroclor 1242 and Aroclor 1254” was attached which reports that after exposing animals to Aroclor vapor, “In all the experiments, animals were killed from one to 15 days after the final period of exposure.” (NCR-FOX-0517837, at 844.)
291. In 1966, Professor Soren Jensen, of the Institute of Analytical Chemistry at Stockholm, Sweden, confirmed the presence of PCBs in fish, birds, eggs, pine needles and children’s hair in samples taken from Swedish coastal areas. (JDGFOX00000965.)
292. Monsanto became aware of Jensen’s work no later than November 1966 (JDGFOX00001347), before the Jensen Report was published. The letter advising Monsanto of Widmark and Jensen’s work states: “Below please find a translation of an article in the Swedish paper *Dagens Nyheter*: ‘It is found in salmon and in pike. It is found in sea eagle living on fish. It is found on the surface of the needles of fir trees, that is in the air. It is found in the hair of a five months baby . . . PCB is broken down considerably slower than DDT and gives rise to damage of liver and skin. PCB is not used as a herbicide. . . . PCB is found in water and in air, and not only in the Swedish air, but also in e.g. London air. . . . PCB is not imported as such. It is also part of several finished products. Nothing is known as to the way in which it reaches the water and the air. According to Mr. Jensen, products containing PCB should have this openly declared.’” (JDGFOX00001347, at 347-349.)

293. A later report of these findings, which has come to be known as “the Jensen Report,” was published on December 15, 1966 in the English journal New Scientist. The report, entitled “*Report of a New Chemical Hazard*,” states that “PCB which is related to and as poisonous as DDT was detected by Mr. Soren Jensen of the Institute of Analytical Chemistry, University of Stockholm, in some 200 pike taken from different parts of Sweden, fish and fish-spawn throughout the country, an eagle which was found dead in the Stockholm Archipelago, and in his own, his wife’s and baby daughter’s hair. . . . PCB is much harder to break down than DDT and there is every reason to suppose that it is much more difficult to get it out of the system. The substance has also been detected in the air over London and Hamberg and also in seals caught off Scotland. It can therefore be presumed to be widespread throughout the world.” (MONSFOX00003427 (emphasis added); NCR-FOX-332381; API’s Responses to Glatfelter’s Interrogatories, No. 9.)
294. WT noted the December 15, 1966 New Scientist report by Professor Jensen, and began to build a dossier containing reports on PCB. (BCFOX00004096, at 099.)
295. According to public relations materials WT shared with Monsanto and NCR: (a) WT decided to change from using PCBs in NCR Paper, “As soon as we became aware of suggestions in scientific journals that PCBs could give problems.” (PHGNCR-2003889; PHGNCR-2003892, at 893.) (b) WT decided to change from using PCBs in NCR Paper because “there was a school of opinion which suggested that the accumulation of PCBs could in time present an environmental hazard.” (*Id.*) (c) “The problem is one of persistence rather than one of toxicity. It has been found that certain PCBs accumulate in the environment.” (*Id.*, at 894.)
296. On October 6, 1966, WT personnel visited the Combined Locks Facility. There was a discussion of on-the-machine CB [coated back, NCR Paper]: “Dayton have not run any trials for a considerable time and as far as Combined Locks are concerned the idea has been abandoned. They, like Wiggins Teape, appear very doubtful that it would be an economical proposition. In fact they said to run this they would need to have a fixed deckle and no machine breaks. They [Combined Locks] also said that emulsion would find its way into the backwater as this occurred in the case of CF despite elaborate precautions.” (BCFOX00027348, at 349 (emphasis added).)
297. Dr. Tucker, who was a senior research chemist for Monsanto in 1967 (Tucker Dep., at 11:12-15), verified the work done by Soren Jensen and Gunthor Widmark, including that the analytical methodology was correct. (*Id.* at 12:2-7, 15:12-17.) By January 26, 1967, Monsanto was able to verify the analytical work of Drs. Jensen and Widmark. (MONSFOX0009810; *see also* Tucker Dep., 14:4-7, 15:12-17.)
298. Monsanto was very concerned about the effect of adverse publicity started by publication of the Jensen Report on its Aroclor business. For instance, a February 10, 1967 Monsanto internal communication states Monsanto is “worried about what is liable to happen in the states when the various technical and lay news media pick up the subject.” (GPFOX00054149.) The same internal communication goes on to state: (a) “We have been receiving quite a few communications from our customers, but the most critical one is NCR, who are very much involved with their carbonless carbon paper.” (b) “We feel

our customers, especially NCR, may ask us for some sort of data concerning the safety of these residues in humans.” (GPFOX00054149, at 149-150 (emphasis added).) On the same day, NCR asked Monsanto for a copy of the Jensen Report. (JDGFOX00000033.)

299. A February 13, 1967 Monsanto internal letter states that after getting the Jensen Report, one of Monsanto’s first priorities is to “talk to the NCR people.” (PHGNCR-2005185, at 186.)
300. On February 27, 1967, Dr. R. Emmet Kelly, Monsanto’s Medical Director, sent a copy of the Jensen Report to Dr. M.J. Thomas, the NCR scientist who ordered the Hilltop toxicology studies and requested toxicology studies from Monsanto in 1965. (Dkt. 659 ¶ 50; JDGFOX00000037.)
301. NCR admits that it received the Jensen Report on February 27, 1967. (Dkt. 659 ¶ 50; Anderson Dep., 264:9-14.)
302. NCR also admits that in 1967, it began to investigate Jensen’s findings and sought additional information from Monsanto. (Dkt. 661 ¶ 46; MONSFOX00097886.)
303. According to an API flyer, ACPC became aware of the Jensen Report in the “late 1960s.” (JDGFOX00000001, at 002.)
304. The Jensen Report was discussed in a telephone call on March 8, 1967, between Dr. Kelly of Monsanto and Dr. Thomas of NCR. (NCR-FOX-0517874.) A March 10, 1967 letter from Dr. Thomas to Dr. Kelly states: “I appreciate your recent telephone call and the updating on the polychlorinated biphenyls situation in Europe. As per our telephone conversation of March 8, I am returning the copy of Dr. Jensen’s paper on the latter subject.” (*Id.*)
305. After the Jensen Report was passed from Monsanto to NCR, Monsanto decided to keep NCR informed of future developments. (Paton Dep., 27:18-28:13.) Monsanto shared these scientific studies with NCR, but not with its other Aroclor customers. (PHGNCR-2007044, at 052.)
306. Between 1967 and 1969, several scientific studies on PCBs were completed and published in the UK and U.S. popular and scientific press. (Dkt. 659 ¶ 51.)
307. The scientific journal Nature published a series of articles from 1967 to 1969 that highlighted the serious environmental effects from exposure to PCBs, including:
  - a. D.C. Holmes, J.H. Simmons, & J.O. Tatton, “*Chlorinated Hydrocarbons in British Wildlife*” (Oct. 21, 1967) (JDGFOX00000999);
  - b. A.N. Holden & K. Marsden, “*Organochlorine Pesticides in Seals and Porpoises*” (Dec. 30, 1967) (JDGFOX00001006);
  - c. R.W. Risebrough, P. Rieche, D.B. Peakall, et al., “*Polychlorinated Biphenyls in the Global Ecosystem*” (Dec. 14, 1968) (JDGFOX00001012); and,

- d. J.H. Koeman, M.C. Ten Noeuer de Brauw, & R.H. de Vos, "*Chlorinated Biphenyls in Fish, Mussels and Birds from the River Rhine and the Netherlands Coastal Area*" (Mar. 22, 1969) ([JDGFOX00001020](#)).
308. In 1967, PCBs were identified in fish and wildlife in Great Britain, UK. On October 21, 1967, an article was published in Nature entitled "*Chlorinated Hydrocarbons in British Wildlife*," which discusses the Jensen Report and states: "We have now been able to show that the long retention time compounds occurring in British wildlife are also polychlorobiphenyl compounds." (JDGFOX00000999, at [1003-004](#).)
309. After the Jensen Report, WT retained Arthur D. Little, Ltd. to research the toxicity of Aroclor 1242. A letter report was issued to WT on February 22, 1968 stating that Aroclor 1242 may "prove to accumulate in the body and possibly present a long-term hazard." ([BCFOX00003773](#).)
310. On January 16, 1968, a Research Chemist at the USF&WS wrote to Monsanto requesting samples of Aroclor 1242, 1254, 1260 and 1268. This letter states: "It has been brought to our attention that presumptive evidence of chlorinated biphenyl and chlorinated polyphenyl compounds have been found in avian and animal tissues." ([GPFOX00141602](#).)
311. In February 1968, the first known mass food poisoning by PCBs occurred in Japan when PCB fluid leaked into a batch of rice-bran oil, or yusho. More than 1,600 people were initially exposed, with many showing immediate symptoms including severe chloracne, respiratory ailments, and failing vision. ([MONSFOX00017783](#).)
312. In August of 1968, NCR began manufacturing its NCR Emulsion in Portage, Wisconsin, along the Upper Fox River. (NCR's Responses to Georgia-Pacific's First Set of Interrogatories, [No. 1](#).)
313. On December 14, 1968, Professor Risebrough of the University of California at Berkeley published a paper in Nature entitled, "*Polychlorinated Biphenyls in the Global Ecosystem*," which demonstrated the existence of PCBs in fish and wildlife along the coast of California. (JDGFOX00001012, at [015](#).) NCR was aware of Risebrough's research and the conclusions he reached. ([MONSFOX00082672](#).)
314. In early 1969, Monsanto initiated an accelerated program with the NCR Paper Research Department to find a replacement for Aroclor in NCR Paper. ([NCR-FOX-050547](#).)
315. By 1969, ACPC was aware of environmental concerns regarding the discharge of PCBs entering the River. (Jezerc Dep. (April 20, 2009), [73:15-24](#).)
316. Internal Monsanto communications on March 4, 1969 and March 28, 1969 report the results of an experiment on incineration of NCR Paper and concludes: (a) "Aroclor is easily volatilized when N.C.R. Paper is burned." (b) "Aroclor undergoes little, if any, decomposition when burned." (c) "Unfortunately, it appears that significant air pollution can occur via burning of N.C.R. paper or other Aroclor containing materials even under more strenuous conditions." It is likely that these results were reported to NCR in

subsequent meetings between NCR and Monsanto where the possibility of incineration of NCR Paper was discussed. (JDGFOX00000065; PHGNCR-2008175; Paton Dep., 32:22-38:17.)

317. On March 12, 1969, Monsanto issued a memorandum setting forth its external communication policy with regard to Aroclors indicating that NCR would continue to receive information related to Monsanto's future plans for Aroclor plasticizers. (PHGNCR-2007044.) Monsanto's position was that "the adverse publicity" associated with these studies "may be very damaging." (Paton Dep., 21:13-22:8; PHGNCR-2007044.)
318. On March 27, 1969, Monsanto visited NCR's home office in Dayton, Ohio. (Paton Dep., 21:1-23:19; MONSFOX0008035.) Mr. Haier, Mr. Wilde and Mr. Paton attended on behalf of Monsanto and Mr. Lauer, Mr. Thacker and Mr. Fitzpatrick attended on behalf of NCR. (Dkt. 659 ¶ 54; MONSFOX00080385.) During the meeting, Monsanto and NCR discussed PCB contamination and a recent San Francisco Chronicle article regarding PCB pollution in San Francisco Bay. (Dkt. 659 ¶ 55; Paton Dep., 18:4-23:19; MONSFOX00080385.) Documents from Monsanto memorializing this discussion note: "NCR would take no action unless a second article appeared specifically naming their [sic] paper as a source of pollution. Such an article could play into the hands of 3-M's Action paper." (MONSFOX00080385, at 385-386 (emphasis added).) NCR was concerned that public disclosure of PCBs in NCR Paper could cause NCR to lose market share to its main competitor, 3M. (McIntosh Dep., 119:1-25; Schwab Dep., 118:13-24; Paton Dep., 24:9-29:24.)
319. In a subsequent April 28, 1969 telephone conversation with Cumming Paton of Monsanto, NCR's Gordon Taylor called the same article, "just another in the series of articles on the toxicity of PCB," and also said that "there was always the possibility that the second shoe would drop." (PHGNCR-2008175.)
320. Between July 1969 and August 1971, at least nine major PCB contaminations of food occurred. Shredded wheat contaminated by packaging material was shipped all over the country; in upstate New York, Campbell Soup had to destroy 140,000 tainted chickens. (MONSFOX00032607.)
321. An internal Monsanto document from September 9, 1969 discusses "Defense of Aroclor" and states: (a) "Water Pollution seems to be first issue . . . Great Lakes . . . Aroclor 1254 will be found! Aroclor 1242 will be found?" (b) "Aroclor degradation rate will be slow. Tough to defend against. Higher chlorinated compounds will be worse than lower chlorine compounds." (c) "Work with large customers to clean-up streams. Bring in Findett as mfg. partner in the recycle business. Get money out of recycle operations." (GPFOX00030757.) It is reasonable to infer that Monsanto discussed these concerns with NCR, since NCR was one of Monsanto's largest customers.
322. On October 31, 1969, Dr. Herbert A. Vodden of Monsanto's research department in Ruabon, South Wales, was made responsible for the environmental aspects of PCB contamination in the UK, including on-going studies of the potential biodegradation of

- Aroclor 1242, the investigation of PCB releases at Monsanto's Newport, UK PCB production facility, and information regarding PCB disposal by Monsanto's major PCB customers in the UK. (Vodden Dep., [18:11-19](#), [20:10-15](#), [23:11-15](#).)
323. An internal Monsanto communication from October 29, 1969 states: "Monsanto confirmed PCBs in mid-1969 and confirmed the adequacy of work by Widmark and Jensen and others – a world wide ecological problem." ([GPFOX00030851](#) (emphasis in original).)
324. In late 1969, Dr. Vodden of Monsanto arranged a meeting with Martin Kelly of NCR's Boreham Wood, UK NCR Paper emulsion production facility. (Vodden Dep., [26:8-20](#).) During the meeting, Dr. Vodden explained to Martin Kelly that Aroclor 1242 had constituents that were persistent and would bioaccumulate, that even though Aroclor 1242 was not detected in the environment, its degradation residues resulting from Aroclor 1242 releases would pose those problems, that the production of NCR Paper resulted in open and uncontrolled releases of Aroclor 1242, and that because of these environmental concerns, Monsanto was going to stop selling it for use in the production of NCR Paper. (Vodden Dep., [26:24-28:5](#); *See also* Dkt. 659 ¶ [66](#).)
325. Documents show Monsanto planned to replace Aroclor 1242 for "nonenclosed systems" by July 1970. However, use of Aroclor 1242 in NCR Paper was to continue through December 1970. ([BCFOX00004417](#).) Monsanto finally told NCR it would not supply Aroclor 1242 after May 1971. (PHGNCR-2007759, at [760](#).)
326. NCR continued to work with Monsanto to find potential replacement solvents for its NCR Paper after Monsanto announced that it would no longer supply NCR with PCBs due to Monsanto's concerns related to the toxicity and biopersistence of PCBs. (Paton Dep., [138:16-142:6](#).)
327. Prior to Monsanto announcing that it was going to stop selling all PCBs, NCR became concerned that Monsanto would stop supplying Aroclor 1242 at some point. (Dkt. 661 ¶ [80](#).)
328. Between 1969 and 1971, WT, NCR and Monsanto received US and UK governmental inquiries about PCB use. (Vodden Dep., [40:10-43:12](#); Dkt. 659 ¶¶ [77](#), [86-88](#).)
329. In November 1969, Monsanto was asked by the UK Ministry of Agriculture, Fisheries and Food to disclose the production and use of PCBs. ([BCFOX00004096](#), at [105](#).) NCR was notified. ([PHGNCR-2007926](#).)
330. In 1969, because of the toxicity, persistence, and bioaccumulative properties of PCBs, Monsanto, the maker of PCBs, decided to eliminate the sale of Aroclor 1242 to NCR for use in production of NCR Paper and announced this decision publicly in May 1970. ([JDGFOX00001703](#), at [704](#).) NCR continued to use Aroclor 1242 in its microcapsules until March 1971. (NCR-FOX-0555642, at [650](#).)
331. In December 1969 and January 1970, Monsanto tested the effluent from NCR's facilities in the U.S. and the UK. (Dkt. 659 ¶ [68](#); Tucker Dep., [39:18-41:20](#).) Effluent samples

from an NCR facility had “quite high” levels of Aroclor 1242 and the mud in the stream taking the surface water drainage contained 150 ppb PCBs. (GPFOX00037483, at 484.)

332. In December 1969, Monsanto analyzed water samples from NCR’s facility in Portage, Wisconsin and determined that Aroclor 1242 was being discharged and “was easily detected at all sampling points and ranged from approximately 1000 ppm at the plant to approximately 1 ppm at the effluent treatment facilities.” (MONSFOX00098648.)
333. On December 16, 1969, Monsanto, NCR and WT met. Notes from this meeting make clear that the following were discussed: (a) Aroclor 1242 “contains many PCBs – principally tri- some mono-, di- tetra- and penta-”; (b) “Sharp peak at the tri- all possible isomers none found in the environment – we think it degrades – 1254 is principally penta- less sharp peak at the penta level than at tri- level of chlorination”; (c) Monsanto leaned toward telling the UK Government about PCBs in NCR Paper, but asked “What would NCR like?”; (d) Effluent sinks and “will be toxic to Benthic plankton”; (e) “Aroclor is liver/kidney toxin”; (f) “Effluent – is toxic in immediate discharge area”; (g) Regarding effluent from NCR’s Portage, Wisconsin facility: “verify Portage has not called State yet,” “hire consultant,” “help City.” (PHGNCR-2007927.) NCR, WT and Monsanto also discussed publicity, “Medical” and “Research” issues concerning Aroclor 1242, including possible replacements, effluent analyses for NCR’s Portage, Wisconsin facility where NCR Emulsion was made, progress on biodegradation research, NCR facility “clean up,” and preliminary incineration data on Aroclor 1242 and NCR Paper. (NCR-FOX-0517876.)
334. On December 31, 1969, WT’s Technical Director, Dr. Rance, wrote to NCR’s Director of Research, G.J. Wilson: “I am sure you are aware of the recent moves in various countries, including the UK, to ban the use of DDT. Equally, you will be aware that Aroclor as used in making NCR paper has close chemical affinities with DDT. We are most concerned about the possible implications for the future of the NCR paper business.” (BCFOX00004030.)
335. NCR admitted in an internal report: “In the late 1960s accumulative evidence began to show that PCBs may have adverse effects on certain forms of animal life. The same properties that contributed to their usefulness were indited [sic] as contributing to the possible hazardous effects . . . NCR[®] paper was a potential hazard during the production, during the printing and direct handing by the customer and finally through being used in recycled stock for food packaging.” (NCR-FOX-350912 (emphasis added).)
336. ACPC learned in 1969 that PCBs were to be phased out of NCR Paper due to environmental concerns. (Jezerc Dep. (April 20, 2009), 74:10-75:21.) Each year between 1954 and 1970, NCR purchased increasing amounts of PCBs from Monsanto for the use in NCR Paper – from 0.6 million pounds in 1957 to 6.6 million pounds in 1970. (Dkt. 659 ¶ 57.)
337. On January 5, 1970, NCR’s licensee WT wrote to NCR identifying almost 50 publications on PCBs / DDT since the 1930s, and concluding, “Present indications are

that DDT and PCBs and their metabolites are accumulated in the body fat rather than being normally broken down and dispersed, and they may affect fertility, cause liver damages and also fatalities in some vertebrates, such as birds and fish.” (BCFOX00004031, at 035.)

338. By January 15, 1970, all Aroclor mixtures, including the specific PCB constituents of Aroclor 1242 had been found in wildlife. (PHGNCR-2004965.)
339. A January 26, 1970 Monsanto internal communication reported sampling results for PCBs in effluent at NCR’s Boreham Wood, UK facility where NCR Emulsion was made. Part of Monsanto’s “Action Plan” discussed in this internal communication was to, “Advise customers on disposal procedures and on Plantkeeping necessary to avoid pollution.” (GPFOX00030927.)
340. At a January 27, 1970 meeting, the UK Ministry revealed to Monsanto that an examination of seals found on the North Cornish coast contained 2,000 parts per million of PCBs, a far higher proportion than anything previously reported anywhere in the world. (GPFOX00030930, at 931.)
341. NCR and WT discussed PCB toxicity and dangers to riverine environments in February 1970. A letter from N.J.M. Bennett of WT Limited to R. Stanley Laing, President of NCR, dated Feb. 3, 1970, states: “You are undoubtedly aware that in recent months alarm has been raised regarding the accumulation in the wild life of DDT and similar materials (known here as PCBs). In several countries, including the UK, government action has been taken, or is under consideration, to prohibit or limit the use of DDT and PCBs. . . . It requires concerted efforts by all of us to avert this serious potential threat to our NCR paper and business.” (APIFOX00023997.)
342. On February 5, 1970, NCR sent a memo to its licensee WT stating, “PCB is toxic and the Ministry have asked Monsanto to give the names of their larger customers for this product. They have not done so yet . . . . We are easily the largest user of PCB in this country and Monsanto and WT discharge their effluent into the Severn Estuary and it is apparent that the main cause of this pollution can eventually be traced to out NCR Paper production.” (BCFOX00004080.)
343. On February 13, 1970, NCR’s licensee WT issued an internal report stating: (a) “PCB is toxic, it accumulates in fish, animal and human bodies and more easily where the blood is cold. The route of ingestion suggested and nowhere refuted is that PCB enters a river from factory effluent, either direct or through sewers, is absorbed by plankton, which is eaten by small fish, which in turn are eaten by larger fish, seals and fish-eating birds. Humans eat fish. At each higher stage of life there is a greater concentration of PCBs retained in the body . . . . Animals heavily dosed with PCB have been known to develop cancer.” (BCFOX00004096, at 102.) (b) “DDT is a cousin of PCB. Like PCB, it is not broken down in the human body. It accumulates and so, theoretically, becomes harmful when a certain excess level is reached.” (*Id.*, at 098-100.)

344. In 1970, WT reports to NCR its estimate that broke, sold over the course of one year by WT to waste paper brokers, contained 800,000 pounds of PCBs, and that repulping this broke resulted in the release of 140,000 pounds of PCBs into rivers throughout the UK. NCR was provided a copy of this report. (*Id.* at 104.)
345. On February 19, 1970, NCR's licensee WT calls a top management level meeting with NCR to exchange views on the "PCB problem." During the meeting, WT described river discharges of PCBs due to the recycling of NCR Paper broke. To illustrate, WT included an Aroclor Mass Balance chart showing that in 1969, 200 tons of broke was sold from the Treforest facility resulting in 70 tons of PCBs discharged to UK rivers. (PHGNCR-2001875.)
346. On February 26, 1970, Monsanto and NCR met and discussed the problem of "quite high levels of Aroclor 1242" at the NCR Paper facility in Boreham Wood, UK. (GPFOX00037483, at 484.)
347. On February 27, 1970, Monsanto sent NCR (and other customers) a letter which states: "Recently, several newspaper and magazine articles have been published indicating that Polychlorinated Biphenyls (PCBs) have been discovered at some points in some marine, aquatic and wildlife environments. . . . [W]e wish to alert you to the potential problem of environmental contamination as referred to in the newspaper and magazine articles." This letter attaches an article from *Chemical Week*, October 29, 1969, which states: "This article reflects the view that good manufacturing practice in the future may require that no products used by any company be lost or discharged in such a manner as to ultimately be found in waterways." (NCR-FOX-0517877.)
348. NCR received Monsanto's March 1970 Technical Bulletin O/PL-306A Aroclor® Plasticizers which stated: "Environmental Hazards Aroclor 1232, Aroclor, 1242, Aroclor 1248, Aroclor 1254, Aroclor 1260, Aroclor 1262, Aroclor 1268, Aroclor 4465, and Montar 1 all contain polychlorinated biphenyls (PCB) of various types and in varying amounts. PCB residues in small amounts have been found in the environment and some studies have indicated that they may be harmful to certain forms of animal life. Extreme care should therefore be taken by all users to prevent any entry into the environment through spills, leakage, use, disposal, vaporization or otherwise. Further, the products in which PCB materials are used, or which are formulated using PCB materials as a component, should be given careful study to eliminate the possibility that PCB might reach the environment as a result of use in a given application." (NCR-FOX-0528363.)
349. In the Spring of 1970, a North Carolina poultry raiser, worried over the low hatching rate of his chickens, ran independent tests and found that the fatty tissue of the birds contained up to 40 ppm of PCBs. The contamination was traced to a Wilmington, North Carolina, fish-meal plant where PCBs were leaking from a pipe in a heating system into the meal. 13,000 tons of tainted feed had been sent to 64 customers in twelve Southern and Midwestern states. (MONSFOX00032607.)
350. A March 2, 1970 Monsanto internal communication confirms that Monsanto, NCR and WT were discussing PCB disposal at NCR and WT facilities. According to this

Monsanto document, “Technical discussions with N.C.R. and Wiggins Teape have resulted in some agreed actions for exchange of information and the provision by Monsanto of analytical data on effluent samples from N.C.R. and WT. N.C.R. effluent has already been shown to be contaminated and suggestions have been made to improve the situation.” (MONSFOX00045805, at [807](#).)

351. A March 6, 1970 Monsanto internal communication discusses the difficulty of controlling the ultimate destination of PCBs in NCR Paper: “The presence of PCB in NCR Paper® poses a particular challenge. The ultimate destination of this product is difficult to control. Normal incineration vaporized the Aroclor which eventually is found somewhere in the environment.” (JDGFOX00000120.)
352. On March 17, 1970, Monsanto offered, by letter dated that same date, to analyze air samples for PCBs for ACPC. (JDGFOX00000123.)
353. On April 6, 1970, ACPC sent air samples from its Appleton, Wisconsin facility to Monsanto for analysis of Aroclor content. Positive results for Aroclors were returned to ACPC on May 12, 1970. (NCR-FOX-517888.)
354. In April of 1970 Congressman William Ryan begins a United States government investigation of PCBs. (Dkt. 659 ¶ [86](#).)
355. On April 29, 1970, Monsanto sent a copy of the Threshold Limit Values for 1969 for toxicity of Aroclor 1242 and Aroclor 1254 to Dan Kay of the NCR Paper Research Department, demonstrating that both are toxic as applied to skin. (PHGNCR-2007097.)
356. By the end of April 1970, Monsanto revised its warning label for Aroclor 1242. (PHGNCR-2000947, at [958](#).) “CAUTION! CONTAINS CHLORINATED HYDROCARBONS Avoid prolonged breathing of vapors or mists. Avoid contact with eyes or prolonged contact with skin. If skin contact occurs, remove by washing with soap and water. Following eye contact flush with water. If clothing becomes soaked with fluid, launder before wearing again.” (*Id.*) Monsanto provides this label to NCR. (Paton Dep, [87:4-88:15](#).)
357. A May 1970 Monsanto internal memorandum states that Monsanto confirmed findings by the UK Ministry of Agriculture Infestation Control Laboratory that PCBs corresponding to Aroclor 1242 were in cardboard packaging used for a wide range of food and pharmaceutical products. (GPFOX00044556, at [557](#).) This same memorandum states: “The Ministry of Agriculture Fisheries & Food Laboratory at Burnham-on-Crouch are continuing their investigation into sources of P.C.B. pollution. They are currently looking at mussels taken from a number of sites in the Severn Estuary/Bristol Channel including sites near [Monsanto’s] Newport plant and the Wiggins-Teape effluent outfall.” (*Id.*)
358. On May 4, 1970, a Monsanto team working on “Environmental Contamination by P.C.Bs” (including U.S. and UK Monsanto personnel) met at Monsanto’s Newport, UK facility and, among other things, discussed “the disposal of waste Aroclor from customers, particularly the resale of paper off cuts by firms such as N.C.R. and Wiggins

- Teape.” (GPFOX00044098, at [100](#).) A May 11, 1970 Monsanto Report discusses this meeting in detail and includes locations of samples of PCBs taken from the nearby Severn Estuary in July and December 1969, showing high levels of PCBs in the River Severn. (*Id.*)
359. On May 10, 1970, *Chemical Industry* published an article entitled “Polychlorinated biphenyl residues,” written by workers at the UK Government Pest Infestation Control Laboratory. (GPFOX00052393, at [395](#).) This article stated that these UK government workers discovered PCBs in cashew nuts during a routine survey for pesticide residues and traced the PCBs to a “particular make of drum . . . currently finding a large number of uses.” (*Id.*)
360. The May 11, 1970 Monsanto Report contains a detailed schematic showing NCR Paper production and waste streams, including the percentage of Aroclor used by NCR in its NCR Paper microcapsules. (GPFOX00052393, at [395](#).) This information must have come from NCR.
361. The May 11, 1970 Monsanto Report also contains results of sampling at NCR’s Boreham Wood, UK facility where microcapsules for NCR Paper were made, showing high levels of PCBs in NCR’s effluent and high levels of PCBs “in mud from bed of stream.” (GPFOX00052393, at [395](#).) Similarly, this Report shows high levels of PCBs in effluent from the WT Treforest, UK facility where NCR Paper was manufactured. (*Id.*) This Report also discusses WT’s waste stream for PCBs, including “paper cut-offs,” i.e. broke, sent from WT Treforest, UK and Nivelles, Belgium. Finally, this Report contains “General Recommendations made to Customers,” including: (a) “Ensure all Aroclor waste is buried on a dry tip.” (b) “Ensure Aroclor does not leak down open drains nor into streams or rivers.” (*Id.*)
362. On May 12, 1970, Monsanto reported to ACPC the presence of PCBs in air samples collected at ACPC’s facility in Appleton, Wisconsin. ([NCR-FOX-0517891](#).) Gordon Taylor of NCR was copied on the letter reporting these test results.
363. A May 1970 document discusses the discovery that “PCBs found in nuts and many other foods in the UK have been traced to Littlejohn packaging drums manufactured from NCR broke paper containing Aroclor 1242 sold by Wiggins Teape.” (PHGNCR-2003373, at [375](#).) This information had to come from NCR’s licensee on NCR Paper for the UK, WT.
364. In June 1970, Monsanto sent letters to its direct customers, including NCR, updating them regarding Monsanto’s February 27, 1970 letter concerning allegations of PCBs as contaminants in the environment. The June 1970 letter states: “Since that time, other reports concerning PCBs have been published. An examination of the PCB matter has indicated that their use in synthetic resin compositions may be a source of the alleged environmental contamination. . . . In view of the allegations which have been made concerning PCBs, and being a concerned and responsible member of the world community, we have come to a decision to discontinue the sale of PCB-containing products for modifier and plasticizer applications effective August 30, 1970.” (Dkt. 661

- ¶ 81; NCR-FOX-0517895.) This information was not communicated to the Defendants. (Heinritz Dep., 94:9-96:4; Christensen Dep., 72:2-73:15.) NCR continued to sell PCB-containing broke for recycling until mid-1971. (Heinritz Dep., 96:14-23.)
365. On June 1, 1970, NCR and Monsanto met to, “discuss toxicity, biodegradation, and analytical techniques associated with Aroclor 1242, MIPB and HB-40.” (Dkt. 661 ¶¶ 114-115; PHGNCR-2003399.) Monsanto wanted NCR to use MIPB or HB-40 in its NCR Paper microcapsules, instead of Aroclor 1242. (*Id.*) At the June 1970 meeting, Monsanto informed NCR that it should move quickly to find a replacement for Aroclor 1242. (Dkt. 661 ¶¶ 114-115; NCR-FOX-0592816, at 832, 836.)
366. On June 11, 1970, NCR and Monsanto met to discuss HB-40 and MIPB 2 as a substitute for Aroclor 1242 in NCR Paper emulsion. (Dkt. 661 ¶ 114; MONSFOX00000151; PHGNCR-2007844.) According to Monsanto documents, “NCR conveyed continuing concerns about . . . toxicity” and “NCR did not fully commit to future full-scale production of MIPB No. 2.” (*Id.*) NCR told Monsanto on June 11, 1970, that it would discuss with WT use of MIPB No. 2 as a substitute for Aroclor 1242. (*Id.*)
367. On June 29, 1970, ACPC sent more air samples from its Appleton, Wisconsin facility to Monsanto for analysis of Aroclor content. Positive results for Aroclors were eventually returned to ACPC on July 15, 1970. (NCR-FOX-517902.)
368. On September 15, 1970, *The Post Crescent*, a Fox Valley newspaper, published an article entitled “Potential Pollutants Worry WDNR,” which reports about studies of PCB impact on aquatic life. (API’s Responses to Glatfelter’s Interrogatories, No. 9.)
369. By September 30, 1970, ACPC had been informed by NCR that MIPB-based emulsion was a “qualified replacement for araclor to satisfy environmental regulations.” (NCR-FOX-0064071, at 079.)
370. On October 12, 1970, William B. Papageorge, Monsanto’s Manager for Environmental Control, wrote to NCR’s Gordon Taylor, Manager of Paper Research, stating: “Enclosed is a copy of a recent article by C.G. Gustafson which appeared in Environment Science and Technology which you may not have seen. No new information is included in this article but to my knowledge this is the first published article that refers to the presence of polychlorinated biphenyls in carbonless reproduction paper.” (NCR-FOX-517913.)
371. In October 1970, the U.S. Department of Agriculture announced a cancellation of PCBs used in pesticides, but allowed for a six-month transition period to allow customers to use existing supplies. (Dkt. 661 ¶ 87; MONSFOX00095569.)
372. In October 1970, *Environmental Science and Technology* published an article entitled “PCBs – Prevalent and Persistent.” (API’s Responses to Glatfelter’s Interrogatories, No. 9.)
373. On November 24, 1970, *Science News* published an article entitled “First DDT, Now PCB.” The “article reports that PCBs have been suspected since 1966 of causing many of the same ill-effects in organisms as DDT” and “states evidence of PCBs dangers have

now accumulated.” (API’s Responses to Glatfelter’s Interrogatories, No. 9; GPFOX00052393.)

- 374. On December 15, 1970, Monsanto sent a letter to NCR, providing biodegradation data on Aroclor 1242. (NCR-FOX-517914.)
- 375. On January 5, 1971, Willis S. Clark of Monsanto wrote to Gordon Taylor of NCR: “I have enclosed a copy of the results of analysis obtained by Dr. E.S. Tucker on the water effluent samples which you submitted to us.” By copy of this memo, I am asking Bill Papageorge to comment on the absolute values of PCBs found, and whether there should be cause for concern for the corporations involved.” (NCR-FOX-517915.)
- 376. At no time prior to May 1971 did NCR or any of its predecessors take any steps to stop or to inhibit recycling of NCR Paper broke or trim at the Defendants’ mills in the Fox River Valley.

#### **VIII. PLAINTIFFS WITHHELD INFORMATION ABOUT PCBS AND MISLED DEFENDANTS AND THE GOVERNMENT ABOUT THE PRESENCE OF PCBS IN NCR PAPER AND THE DANGEROUS NATURE OF PCBS**

##### **A. Plaintiffs Withheld Information that NCR Paper Contained PCBs**

- 377. NCR, WT and Monsanto’s plan was to get out of the manufacture of NCR Paper that contained PCBs before there was widespread knowledge of PCBs in NCR Paper. (BCFOX00004096, at 105; PHGNCR-2003889, at 892.)
- 378. Neither ACPC nor NCR disclosed its use of PCBs in NCR Paper to the paper recycling industry generally, or the Lower Fox River paper recycling mills or POTWs specifically.
- 379. ACPC employees who sold NCR Paper broke testified that they did not tell any recycling mill about PCBs in NCR Paper. (Heinritz Dep., 94:9-96:4; Christensen Dep., 72:2-73:15.)
- 380. The broker who sold broke to some of the Defendants was never told by NCR that the broke may have been coated with PCB emulsion, or was coated with anything harmful to the environment. (Golper Dep., 15:22-18:4.)
- 381. In fact, starting in 1969, NCR and Monsanto, NCR and WT worked together to keep secret the fact that NCR Paper contained PCBs until 1971, when keeping the secret was no longer necessary, replacement solvents having been found. (PFOF Nos. 295; 298; 299; 305; 317-319; 324-376; 382-401; 422-429.)
- 382. Between 1969 and 1971, Monsanto received U.S. and UK governmental inquiries about PCB use. (Dkt. 659 ¶ 77.)
- 383. On December 19, 1969, Gordon Taylor of NCR contacted Monsanto and suggested that Monsanto respond to the UK Ministry of Agriculture’s request for PCB information that “The PCB used goes into a paper product manufactured in South Wales. The paper

contains an additive which in turn contains the PCB. This additive is manufactured in a London area plant. It is located in the Thames River shed.” (PHGNCR-2007926.)

384. On January 26, 1970, Monsanto, NCR and WT met again. By the time of this meeting, NCR Paper had become a \$45 million business for WT and was “by far their most profitable line – hence their concern at main board level.” (PHGNCR-2001880, at 881.) At this meeting, both NCR and WT were “very concerned about the developing PCB residue situation, even though it is the higher chlorinated compounds that are currently being found in nature.” (*Id.* at 880.) NCR and WT asked Monsanto to “not identify NCR Paper as a major outlet for Aroclor” in Monsanto’s upcoming meeting with the UK Ministry of Agriculture stating further that, “A few weeks delay would give them time to check that their own housekeeping was as it should be.” (*Id.*)
385. On January 27, 1970, Monsanto attended a meeting with the UK Ministry of Agriculture, Fisheries and Food. (Dkt. 659 ¶ 78.) Attendees at the meeting were Dr. Vodden and Mr. Cameron for Monsanto and Mr. Portman and Mr. Wood for the UK. (*Id.* ¶ 79.) NCR asked Monsanto not to identify NCR Paper as a “major outlet” for Aroclor at the meeting between Monsanto and the UK Ministry. (*Id.* ¶ 82.) Monsanto did not disclose NCR’s use of PCBs in NCR Paper at the meeting. (*Id.* ¶ 83; Vodden Dep., 40:10-43:12.)
386. A Monsanto internal communication discussing the January 27, 1970 meeting with the UK Ministry states that when Ministry officials questioned Monsanto about quantities of PCB used in the UK and the major industrial applications, “No mention was made of NCR but it will become increasingly difficult to maintain this position. Indeed, continuing to do so might only highlight the NCR Paper application when it becomes, as it must, more widely known. WT make NCR Paper at their Treforest Mill in South Wales, so mill effluent might easily enter the Bristol Channel.” (Dkt. 659 ¶ 83.)
387. In early March 1970, NCR UK agreed that Monsanto could name it in meetings with the UK Ministry of Agriculture. (GPFOX00030975, at 979.) However, NCR UK was overruled by NCR Dayton the day before the meeting with the Ministry took place. (BCFOX00004235, at 235.) “The day before the meeting Monsanto U.K. were instructed by Monsanto U.S.A. not to disclose the NCR application, or the name of Wiggins Teape. National Cash London received a similar instruction from Dayton. The U.K. companies completely disagree with this decision, and fell that they are sitting on a potential time bomb . . . .” No disclosure was made at the subsequent meeting. (*Id.*) No disclosure was made at the subsequent meeting. (*Id.*)
388. However, during Monsanto’s March 10, 1970 meeting with the UK Ministry of Agriculture, Monsanto again did not disclose the fact that NCR Paper contained PCBs. Monsanto’s internal memorandum states that it was “able to preclude the direct question ‘who are the main users of PCBs and where are they located?’ . . . by leading the discussion away from sensitive areas, by prolonging the further exchange of analytical techniques, and by encouraging debate as to why the PCB residues commonly found in nature more closely resembled pentachlorodiphenyl.” (GPFOX00030975, at 975-976.)

389. On April 9, 1970, Congressman William P. Ryan wrote to Monsanto and made a public statement asking that Monsanto “release to the public a complete list of the uses of AROCLOR, as well as the names of the products and their manufacturers, so that consumers can be aware of the presence of PCBs.” (GPFOX00039636, at 637; MONSFOX00058309; Dkt. 659 ¶ 87.) Congressman Ryan sought information related to the uses, products, manufacturers, environmental impacts and plans for control for Aroclor. (GPFOX00039636.)
390. On April 10, 1970, Monsanto responded to Congressman Ryan through a Press Release, which did not disclose NCR’s use of PCBs and claimed that the electrical application market is the “principle market” for PCBs. (Dkt. 659 at ¶¶ 87-88; MONSFOX00056845, at 846.) Monsanto’s Press Release stated, in part: “PCB is not a household product, as some have suggested,” and that “[t]o our knowledge, it is not used in plastic food wraps, house paints, cellophane, asphalt or tires. The principal market is electrical applications where the chemical performs a vital function as an insulating fluid. In this use, PCB is completely sealed in a metal container. Other major markets employ similar closed systems.” (MONSFOX00056845, at 846.)
391. As a result of Congressman Ryan’s public statement calling for Monsanto to identify all uses of Aroclors (MONSFOX00058309), Monsanto received many inquiries from various reporters concerning the uses of Aroclors. Monsanto did not disclose the fact that NCR Paper contained Aroclor, even though NCR was Monsanto’s single largest customer. (MONSFOX00056845, at 846; GPFOX00039264, at 270-273.) For example, on April 10, 1970, E.V. John, in Monsanto’s Public Relations Department, advised reporters from the Globe Democrat and Post Dispatch that PCBs are not a household product and that “[t]he primary markets are in electrical equipment and heat-transfer systems.” (MONSFOX00060512, at 513.)
392. In a meeting with Congressman Ryan on April 16, 1970, Monsanto officials refused to identify any of the names of manufacturers of products containing PCBs and assured Congressman Ryan that “the major use for Aroclors was in the electrical industry primarily in transformers.” (GPFOX00039045, at 046-047.) In a follow-up letter to Congressman Ryan, Monsanto again refused to supply a list of its PCB customers, stating that “to release a complete list of uses for Aroclor®, names of products and manufacturers, as you suggest, would only cause undue alarm to the public and would make no contributions in this area.” (GPFOX00039264, at 272.) Monsanto instead reiterated that “the major markets for PCB-containing products are in electrical applications, where the fluid is sealed into an electrical component, and in closed system heat-transfer usages.” (*Id.*)
393. In April 1970, the Chief Analyst at the UK Department of Agriculture and Fisheries Infestation Control Laboratory, Mr. Bailey, started to piece together the puzzle that PCBs were used in NCR Paper and that materials made from recycled NCR Paper contained PCBs as well. An April 13, 1970 WT Butler’s Court memorandum, documents that Mr. Bailey had discovered that cashews he was feeding to his laboratory animals contained PCBs and that the PCB contamination had come from the cardboard container packaging. (BCFOX00004300.) WT recognized that, “The fact that PCB has shown up in

cardboard, suggests that broked [sic] or waste NCR paper could have been used in its manufacture. This would appear to be one of the worst ways in which we could become implicated, as cardboard drums have so many uses associated with foodstuffs, and if the waste NCR paper is the source, rather than broke, we shall have no control over its continued use in such products.” (*Id.* at 301.) An April 16, 1970 WT memorandum from Clive Capps further documents the chain of events and adds that Mr. Bailey sent a sample of the cardboard packaging to Monsanto for analysis and that Aroclor 1242 was identified. (BCFOX00004305.) Mr. Capps goes on to state that: “Monsanto must now report back to Bailey that there is PCB (Aroclor 1242) present in the cardboard. The obvious question Bailey will ask is ‘do you know of any applications of PCB in the paper industry?’ With [WT] taking 40% of U.K. sales, the answer is rather obvious.” (BCFOX00004305.)

394. From April 14-16, 1970, WT, Monsanto and NCR all met to devise a plan for responding to Mr. Bailey’s discovery that PCBs were used in NCR Paper, and the fear that Mr. Bailey would imminently discover that recycling NCR Paper resulted in PCB contamination of the resultant paper product. (BCFOX00004305, at 305-307.) At this meeting, WT, Monsanto and NCR decided that “Consideration must now be given as to what to do about the sale of broke” and that “The programme to change from Aroclor to another solvent should be looked at again to see if it is possible to reduce the changeover time.” (*Id.* at 307.)
395. On April 16, 1970, Monsanto met with WT to discuss the discovery by the UK Ministry of Agriculture Fisheries and Food of PCBs in a cardboard carton used for packaging cashew nuts. (MONSFOX00031834.) Monsanto examined a sample of the cardboard and “confirmed PCB is present – the chromatogram is virtually identical to that for Aroclor 1242.” (*Id.* at 835.) WT traced the contamination to NCR Paper “broke” from its Treforest, South Wales, UK facility that got into the furnish for the cardboard. From this memorandum, it is clear that WT had discussions with both Monsanto and NCR about this situation: “As this situation has developed over the past seven days [WT] have liaised closely with NCR and ourselves.” (*Id.* at 834.) WT’s investigation determined that “broke” from NCR Paper produced at its Treforest facility had been used in the manufacture of the cardboard. (*Id.* at 835.) After consultation with NCR, WT had decided to disclose the presence of Aroclor 1242 in NCR Paper: “Following the detection of what seemed to be a lower chlorinated PCB in a cardboard carton by [the Ministry of Agriculture Fisheries and Food], [WT] decided that, in their own self interest, they could remain silent no longer about their usage of Aroclor 1242.” (*Id.* at 834; Dkt. 659 ¶ 84.)
396. The following day, on April 17, 1970, Monsanto met with the Ministry of Agriculture Fisheries and Food and “disclosed, in confidence, the usage of Aroclor 1242 in NCR paper, and explained the relationship between NCR and [WT] and their respective roles in the production of this specialty paper.” (MONSFOX00034522 (emphasis added).) A Monsanto internal communication describes the reaction of the representatives of the Ministry: “There was little reaction save for the comment that here was a further 1242 application which made it still more difficult to explain why the wild life residues examined by [the Ministry] more closely resembled 1254 than any other grade.”

(MONSFOX00034522.) The Ministry did not seem to “attach much significance to [Monsanto’s] disclosure.” (*Id.* at 523.) According to D.S. Cameron, the author and person present for Monsanto at the meeting, “I judged their initial reaction to be one of confusion, since they still seem to be looking for major applications for Aroclor 1254.” (*Id.*)

397. In April 1970, WT asked Monsanto representatives to try to persuade the Ministry of Agriculture to not allow Mr. Bailey to publish the article linking PCBs in cardboard packaging with NCR Paper. (BCFOX00004323, at 324.) These attempts were unsuccessful.
398. After the publication of Mr. Bailey’s letter in Chemical Industry on May 10, 1970, NCR, WT and Monsanto spoke and agreed to answer any questions about the discovery of PCBs in the cashew nuts that was traced to cardboard containers as follows:

We do not sell PCBs to cardboard manufacturers and we do not know how PCB residues come to be found in cardboard. However, we think we know of a probable source of the PCB reportedly found in cardboard, and we understand the practice that could account for it has now ceased.

(PHGNCR-2005743.)

399. NCR, WT and Monsanto knew that the practice referred to in the proposed response to the May 10, 1970 Chemical Industry publication on PCBs in cashew nuts “is, of course, the sale of NCR paper broke by Wiggins-Teape. They are now stockpiling it until deciding how else they should dispose of it.” (PHGNCR-2005743.)
400. NCR, WT and Monsanto decided that if the proposed response to questions about the May 10, 1970 Chemical Industry publication on PCBs in cashew nuts “do not satisfy the enquirer then we should state that we cannot comment further since one of our customers is involved and we must consult them. We shall then notify NCR/Wiggins-Teape of the enquiry and they will assume responsibility for handling it from there on. They both realize that we cannot go on answering questions on their behalf beyond a certain point and would not wish us to do so.” (PHGNCR-2005743.)
401. On June 18, 1970, Congressman Ryan responded to Monsanto’s letter, again asking for a “complete list of the uses of Aroclor, as well as the names of the products and their manufacturers, so that consumers can be aware of the presence of PCBs.” (MONSFOX00087969, at 970.) Monsanto responded again that, “Release of a complete list of the uses of chlorinated biphenyls at this stage would serve no useful non-political purpose.” (GPFOX00039264, at 269.)
402. Despite the 1970 discovery of PCBs in cardboard from NCR Paper broke in the UK, there is no evidence to suggest that any warnings were ever given by NCR to stop selling NCR Paper broke for use as furnish in making paper. (*See* Suess Dep., 70:15-71:11.)
403. A January 12, 1971 letter from the American Paper Institute to the members of its Combination Paperboard Division, Paperboard Group, identified NCR as the cause of all

PCBs found in paper stock. The American Paper Institute's January 12, 1971 letter stated that: (a) PCBs, "the vehicle for dye material in carbonless copy paper is a severe contaminant of paper stock and can migrate from combination paper to food products." (b) "The chemical used as a vehicle to carry the dye in the capsule is poly-chlorinated biphenyl and it is manufactured by Monsanto Corporation under the brand name of Arochlor." (c) "[W]e suggest you advise your paper stock dealers and mill personnel to be careful that paper stock to be used in making combination paperboard for food packaging does not include carbonless copy papers." (d) "NCR is aware of the situation and we understand that steps are underway to remove this type of vehicle from use in applying carbonless coatings." (NCR-FOX-334431.)

404. None of the Defendants were members of the Combination Paperboard Division or received the January 12, 1971 letter to the Combination Paperboard Division until the fall of 1971, at the earliest.

**B. Plaintiffs Received Warning About the Dangers of PCBs from Monsanto and Failed to Disclose those Warnings to Defendants**

405. From before May 2, 1947, Monsanto warned for Aroclor: "AVOID REPEATED CONTACT WITH SKIN AND INHALATION OF THE FUMES AND DUSTS." (PHGNCR-2000965, at 971.)
406. Monsanto's warning from before May 2, 1947 was not passed on by NCR or ACPC to paper brokers or the mills that recycled NCR Paper. (Golper Dep., 15:22-18:4; Heinritz Dep., 94:9-96:4; Christensen Dep., 72:2-73:15.)
407. On August 11, 1954, Monsanto warned for Aroclor 1242: "CAUTION! AVOID PROLONGED AND REPEATED CONTACT WITH SKIN. AVOID PROLONGED BREATHING OF VAPOR AND DUST." (PHGNCR-2000947.)
408. Monsanto's August 11, 1954 warning was not passed on by NCR or ACPC to the paper brokers or the mills that recycled NCR Paper. (Golper Dep., 15:22-18:4; Heinritz Dep., 94:9-96:4; Christensen Dep., 72:2-73:15.)
409. On May 7, 1959, Monsanto warned for Aroclor 1242: "CHLORINATED HYDROCARBONS Avoid prolonged breathing of vapors or mists. Avoid contact with eyes or prolonged contact with skin. If skin contact occurs, remove by washing with soap and water. Following eye contact flush with water. If clothing becomes soaked with fluid, launder before wearing again." (PHGNCR-2000965, at 971.)
410. Monsanto's May 7, 1959 warning was not passed on by NCR or ACPC to paper brokers or the mills that recycled NCR Paper. (Golper Dep., 15:22-18:4; Heinritz Dep., 94:9-96:4; Christensen Dep., 72:2-73:15.)
411. On August 20, 1959, Monsanto warned for Aroclor: "CHLORINATED Diphenyl-TECH CAUTION! AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. AVOID BREATHING OF VAPOR AND FUMES." (PHGR2000965, at 970.)

412. Monsanto's August 20, 1959 warning was not passed on by NCR or ACPC to paper brokers or the mills that recycled NCR Paper. (Golper Dep., [15:22-18:4](#); Heinritz Dep., [94:9-96:4](#); Christensen Dep., [72:2-73:15](#).)
413. On May 27, 1964, Monsanto warned for Aroclor 1242: "CAUTION – Harmful if swallowed. Keep out of the reach of children." ([MONSFOX00097833](#).)
414. Monsanto's May 27, 1964 warning was not passed on by NCR or ACPC to paper brokers or the mills that recycled NCR Paper. (Golper Dep., [15:22-18:4](#); Heinritz Dep., [94:9-96:4](#); Christensen Dep., [72:2-73:15](#).)
415. Dr. Scott Tucker was the primary analytical chemist at Monsanto working with PCBs in the environment. He testified that it is his understanding, based on his personal knowledge and involvement, that Monsanto was keeping NCR up-to-date with the status of his analytical investigations. (Tucker Dep., at [28:4-8](#).) Dr. Tucker further testified that there was never a time when he was told to withhold information from customers, including NCR, in connection with the findings he was arriving at and likewise he never instructed anyone working underneath him to withhold such information. (Tucker Dep., [18:11-22](#), [29:5-17](#).) According to Dr. Tucker, Monsanto never told NCR that Aroclor 1242 was not an environmental contaminant, that Aroclor 1242 was completely biodegradable, or that Aroclor 1242 was not environmentally persistent. (Tucker Dep., [59:15-60:6](#).)
416. In March 1970, Monsanto warned NCR that: "Environmental Hazards Aroclor 1232, Aroclor, 1242, Aroclor 1248, Aroclor 1254, Aroclor 1260, Aroclor 1262, Aroclor 1268, Aroclor 4465, and Montar 1 all contain polychlorinated biphenyls (PCB) of various types and in varying amounts. PCB residues in small amounts have been found in the environment and some studies have indicated that they may be harmful to certain forms of animal life. Extreme care should therefore be taken by all users to prevent any entry into the environment through spills, leakage, use, disposal, vaporization or otherwise. Further, the products in which PCB materials are used, or which are formulated using PCB materials as a component, should be given careful study to eliminate the possibility that PCB might reach the environment as a result of use in a given application." (NCR-FOX-0528363, at [375](#).)
417. Despite the specific warning about using PCBs in paper, Monsanto's March 1970 warning was not passed on by NCR or ACPC to paper brokers or the mills that recycled NCR Paper. (Golper Dep., [15:22-18:4](#); Heinritz Dep., [94:9-96:4](#); Christensen Dep., [72:2-73:15](#).)
418. By the end of April 1970, Monsanto revised its warning label for Aroclor 1242 to read: "CAUTION! CONTAINS CHLORINATED HYDROCARBONS Avoid prolonged breathing of vapors or mists. Avoid contact with eyes or prolonged contact with skin. If skin contact occurs, remove by washing with soap and water. Following eye contact flush with water. If clothing becomes soaked with fluid, launder before wearing again." (PHGNCR-2000947, at [958](#).) Monsanto provided this revised warning label to NCR. (Paton Dep., [86:12-88:15](#).)

419. Monsanto's warning from around the end of April 1970 was not passed on by NCR or ACPC to paper brokers or Defendants. (Golper Dep., 15:22-18:4; Heinritz Dep., 94:9-96:4; Christensen Dep., 72:2-73:15.)
420. In June 1970, Monsanto sent letters to its direct customers, including NCR, updating them from Monsanto's February 27, 1970 letter on allegations of PCBs as contaminants in the environment. The June 1970 letter states: "Since that time, other reports concerning PCBs have been published. An examination of the PCB matter has indicated that their use in synthetic resin compositions may be a source of the alleged environmental contamination. . . . In view of the allegations which have been made concerning PCBs, and being a concerned and responsible member of the world community, we have come to a decision to discontinue the sale of PCB-containing products for modifier and plasticizer applications effective August 30, 1970." (Dkt. 661 ¶ 81; NCR-FOX-0517895, at 895-896.) This letter specifically referenced Aroclor 1242. (Dkt. 661 ¶ 81; NCR-FOX-0517895.)
421. The information in Monsanto's June 1970 letters was not communicated to the Defendants by NCR or ACPC. (Heinritz Dep., 94:9-96:4; Christensen Dep., 72:2-73:15.) NCR and ACPC continued to sell PCB-containing broke for recycling until mid-1971. (Heinritz Dep., 96:14-97:25.)

**C. Plaintiffs Withheld Information and Provided False Information to Defendants and the Public Concerning the Dangerous Nature of PCBs**

422. After NCR's use of PCBs in NCR Paper became known in 1971, NCR downplayed the significance of the possible negative effects of PCBs on the environment. (NCR-FOX-0159623.)
423. On October 6, 1971 Pete Marsh at Monsanto sent a letter to Ian Hendry at WT regarding an upcoming meeting between Monsanto and WT regarding publicity on PCBs and noting that "unfortunately interest is now being shown in the carbonless paper applications both in the USA and Europe. (BCFOX00004689.) The recent piece in the 'International Herald Tribune' dealing with the problems of wastepaper recycling gives us a good example." Mr. Marsh also inquired whether "it would be worth while checking back with NCR (USA) on the attitude they are adopting with their own press and Government agencies?" (*Id.*) Monsanto and WT apparently made this inquiry, because on October 13, 1971, NCR responded. (BCFOX00004696.)
424. On October 13, 1971, ACPC's Tom Busch wrote to H.F. Rance of WT responding to Mr. Rance's telephone call regarding "information on recent news items in the United States concerning PCBs and the official response by government agencies and by [NCR]" and stating that: "It is recognized that the NCR Paper forms records throughout the files in the nation constitute a large tonnage of paper which will continue to be part of an office waste for many years in the future. There are estimates that this amount of paper is many more tons than the unprinted paper now in inventory. Therefore, the fact that PCBs have been discontinued in carbonless copy paper has lead the conclusion that the matter can only improve with time." (BCFOX00004696, at 696-697 (emphasis added).)

425. On the next day, October 14, 1971, ACPC's Tom Busch sent WT a telegram with NCR's press statement, should it be needed. This statement misled by stating that:

Polychlorinated biphenyls (PCBs) formerly were used as a solvent in the production of NCR Paper. However, when it was learned that PCBs may create environmental problems, the company launched an extensive research program to find a suitable substitute. This program was successful and last spring NCR discontinued all use of PCBs in production of NCR Paper.

(BCFOX00004704; BCFOX00004739.)

426. On November 2, 1971, C.V. Truax, NCR's Director of Public Relations, gave an interview to CBS News that misled by omission: "Polychlorinated biphenyl (PCBs) formerly were used as a solvent in the production of NCR paper. However, when it was learned that PCBs may create environmental problems the company launched an extensive research program to find a suitable substitute. This program was successful and last spring NCR discontinued all use of PCBs in the production of NCR [P]aper. . . . Negligible quantities of paper from production prior to June 1971 may still be in inventory at printers or convertors." (NCR-FOX-517934 (emphasis added).)

427. On February 18, 1976, NCR's Appleton Papers, Inc. division issued a statement to the WDNR, which quoted John P. Reeve, Division President; Thomas W. Busch, Vice President of Technical Research and Development; and, Walter E. Spearin, Vice President for Environmental Control, which publicly stated that:

- a. "The paper industry does not directly use PCBs in manufacture. Although Aroclor 1242 was formerly used as a dye solvent in NCR Paper, its use was minute in comparison with other PCB applications outside the paper industry."
- b. "'We'd like to emphasize that we stopped using PCBs in our NCR Paper manufacture in April 1971,' Spearin stresses. 'During the past five years, we introduced no PCB in our finished paper; thus our waste trim and waste waters of our microcapsule manufacturing plants would reflect this change.'"
- c. "Regarding pre 1971 NCR Paper already in office files, Busch adds, 'No scientific evidence exists for fearing this paper to be a hazard.'"

(NCR-FOX-0159623, at 625.)

428. In contrast to NCR's public statements, NCR had already concluded by 1972 that:
- a. "In the late 1960's accumulative evidence began to show that PCBs may have adverse effects on certain forms of animal life. The same properties that contributed to their usefulness were indited (sic) as contributing to the possible hazardous effects. The resistance to

breakdown – such as thermal and biodegradation – was shown to lead to accumulations in the environment. These accumulations (in relation to PCB solvent properties) found their way into animal life as a result of PCB solubility in fatty tissue. The aquatic and fowl forms of life are particularly affected. Domesticated animals (and subsequently human beings) are contaminated through accident or such things as paints containing PCBs.”

- b. “NCR paper was a potential hazard during the production, during the printing and direct handling by the customer and finally through being used in recycled stock for food packaging. The biological effects of PCBs are not completely defined and are still being investigated. The materials can be lethally toxic to aquatic forms of life.”
- c. “The accumulation in bird and mammal liver and fatty tissues represents a danger to human beings from transfer through consumption of animal products.”

(NCR-FOX-350912, at 916-917 (authenticated as Exh. 427 at Rench Dep., 166:4-167:8).)

429. At the time of its February 18, 1976 statement to the WDNR, NCR also understood that PCB regulations being considered by the WDNR likely would affect recyclers of paper: “It is the recyclers, in the Wisconsin paper industry, who may have problems in meeting these standards. This industry neither manufactures nor uses PCBs as such. A small percentage of the bulk of the paper used in their recycling operations, however, consists of NCR Carbonless copying paper, made before 1971. This paper contains Aroclor 1242 in the capsular IP solvent. There is no practical method of separating this ‘contaminated’ paper from the rest (other recycled papers may also contain PCBs as an ink component). The Appleton Papers Division, not being a recycler, does not have this particular problem.” (NCR-FOX-0537018, at 020.)

**IX. INSTEAD OF WARNING DEFENDANTS AND THE PUBLIC ABOUT THE PRESENCE OF PCBs IN NCR PAPER OR ABOUT THE DANGEROUS NATURE OF PCBs, PLAINTIFFS INCREASED THEIR USE OF PCBs AND OUTPUT OF NCR PAPER**

**A. Plaintiffs Took No Actions to Prevent Continued Recycling of NCR Paper During the Production Period**

430. NCR and ACPC took no actions to prevent the continued recycling of NCR Paper at any time, even after it knew or should have known of the risks associated with PCBs. (Rodricks Expert Report at 7, 9, 36, 43, 48-49; Heinritz Dep., 96:14-97:25.)
431. NCR and ACPC never gave any warnings to stop selling NCR Paper broke for use as furnish in making paper at any time.

432. NCR did no testing to assess PCB chronic toxicity, persistence and bioaccumulation. Any testing NCR did for acute toxicity fails to prove that PCBs were not chronically toxic or did not bioaccumulate. (Anderson Dep., [246:5-253:4](#).)
433. WT stopped recycling broke in February 1970. (Dkt. 661 ¶ [166](#).) NCR did not. (Heinritz Dep., [96:14-97:25](#).)
434. ACPC revenue in the 1960s from the sale of its broke amounted to less than 0.5% of its revenue from the sale of NCR Paper. (Cason Expert Report at [Schedule 1 and 4](#).) All broke sales yielded only tens of thousands of dollars per year from 1954 to 1968. (Cason Expert Report at [Schedule 1 and 4](#).)
435. Disposing of the NCR Paper broke in a landfill would have been inexpensive. (NCR-FOX-0064103, at [107](#).) An internal ACPC document reports that ACPC disposed its solid waste in 1970 at the cost of \$1,375/month. (*Id.*) ACPC generated 13 tons per day of solid waste. (*Id.*) At that rate, the flat-fee contract translated to an average charge of less than \$5 per ton.
436. The cost of NCR warning ACPC, Combined Locks, Mead and WT to take special care in treating process waste water would have been minimal.
437. ACPC, Combined Locks or Mead could have easily mitigated at least some of the risk from recycling NCR Paper by landfilling its broke, pre-treating its waste water, or warning the Appleton POTW and NM POTW.

**B. Plaintiffs Were Slow to Remove PCBs from NCR Paper**

438. Monsanto and NCR knew from before 1950 that PCBs, including Aroclor 1242, were toxic. (PFOF Nos. 148-151; 153; 251-270.)
439. In 1955, NCR (Howard G. Stroble) experimented with using HB-40, a solvent later selected to replace Aroclor in the NCR Emulsion. (APIFOX00060801, at [809](#); NCR-FOX-566659, at [727](#); NCR-FOX-0566766, at [774](#), [779](#), [806](#).)
440. By 1965, NCR successfully made capsules for use in carbonless copy paper using non-PCB-containing solvents that it eventually used to replace Aroclor 1242 and it continued to do so through the 1960s and early 1970s. (HB 40: NCR-FOX-0525941, at [965](#); APIFOX00057666, at [679-680](#), APIFOX00057029, at [033](#), [034](#); APIFOX00076165, at [172](#); NCR-FOX-0566659, at [728](#); APIFOX00007730, at [8000-057](#); and MIPB: APIFOX00057666, at [680](#); APIFOX00058297, at [300](#); APIFOX00057248, at [278](#); APIFOX00056115, at [166](#); APIFOX0007730, at [8000-057](#); APIFOX00057217, at [230](#), [233](#).) NCR's Chemical Development Department had found the replacement solvent that it eventually substituted for Aroclor, MIPB, sometime before the end of 1968. (Brockett Dep., [68:1-17](#).)
441. Sometime in May 1970, NCR demonstrated that HB-40 was an acceptable substitute for Aroclor 1242 in its European operations. ([MONSFOX00099563](#).) After NCR proved that HB-40 was an acceptable substitute, WT, NCR's licensee in Europe, stopped making

NCR Paper with PCBs in July 1970 as a result of the public concerns about the dangers of PCBs to the environment. (GPFOX00030897.)

- 442. In the fall of 1970, NCR ran tests on MIPB, as a possible substitute for Aroclor 1242. NCR was doing trial runs with customers that were expected to take until late 1970 or early 1971. (JDGFOX00000149, at 151.)
- 443. By October 1970, ACPC reported that MIPB was used to produce 175,000 pounds of paper and was “a qualified replacement for Aroclor to satisfy environmental preservation regulations.” (GLTFOX00003718, at 726.)
- 444. “By June 1971, Aroclor had been completely replaced as the encapsulation solvent for NCR [P]aper.” (NCR-FOX-0520547, at 551-552.)

**C. Plaintiffs Increased Production of NCR Paper Despite Their Knowledge of the Risks of PCBs If Released to the Environment**

- 445. From 1957 to 1971, NCR bought over 44,000,000 pounds of PCBs from Monsanto. (GLTFOX00001900, at 901.)
- 446. As the knowledge of the dangers of PCBs was being publicized in the world press, NCR’s sales were increasing: “NCR’s Special Products Division, organized in 1967 to consolidate corporate activities pertaining to unique, proprietary products resulting from research, achieved a 20% increase in sales in 1969. The largest contributor to this record volume was NCR Paper®, which is widely used in the manufacture of carbonless business forms.” (NCR-FOX-0417219, at 224.)
- 447. Throughout the Production Period, including after NCR learned of the risks of PCBs, it continued to increase its purchase of PCBs from Monsanto. (GLTFOX00001900, at 901.)
- 448. By the end of 1964, sales of NCR Paper had “more than doubled [in the past five years], with an annual volume exceeding \$26 million.” (GPFOX00140213, at 221.)
- 449. In 1965, sales of NCR Paper again increased by 20%. (GPFOX00140247, at 250.)
- 450. By the end of 1967, NCR “experienced another substantial increase in sales” of NCR Paper with sales for 1967 alone at \$48 million. (GPFOX00140313, at 330.)
- 451. By 1968, NCR was the largest United States purchaser of PCBs for use in open applications, purchasing about 6 million pounds of Aroclor 1242 from Monsanto in 1968. (PHGNCR-2007044.)
- 452. After NCR received the Jensen Report, NCR increased its consumption of PCBs from 4.4 million pounds (1967) to 5.8 million pounds (1968) to 6.3 million pounds (1969) to 6.6 million pounds (1970). (Dkt. 659 ¶ 58.)

453. At the same time, NCR increased its NCR Paper emulsion production from 7.8 million pounds (1967) to 10.3 million pounds (1968), to 11.3 million pounds (1969), to 11.8 million pounds in 1970. (Dkt. 659 ¶ 60.)
454. In 1968, a year after it received the Jensen Report, NCR opened the NCR Paper Capsule Facility on the Upper Fox River. (PFOF No. 29.)
455. In 1969, NCR began manufacturing the PCB-containing CB form of NCR Paper at its newly acquired Combined Locks Facility, which discharged waste waters directly into the Lower Fox River, after save-alls. (PFOF No. 113.)
456. From 1969 to 1971, the Combined Locks Facility discharged waste water containing PCBs from the Combined Locks Mill to the Lower Fox River. (Klass Decl. ¶¶ 11, 12, filed at Dkt. 578-6 at 4.)
457. Around the late 1960s and 1970, NCR Paper was one of NCR's most lucrative products. (Dkt. 659 ¶ 61.) NCR considered NCR Paper one of its "cash cows." (Rench Dep., 131:12-24.) A "cash cow" was important to NCR at this time because its cash register and computing systems product lines were not profitable. (Rench Dep., 189:2-190:2; McKinney Dep., 151:23-152:10.)
458. By January 26, 1970, NCR Paper had become a \$45 million business for WT alone and "by far their most profitable line." (PHGNCR-2001880, at 881.)
459. NCR's sales of NCR Paper continued to grow throughout the Production Period, and continued to grow even after it discontinued the use of PCBs in its NCR Paper. NCR produced millions of pounds of emulsion for NCR Paper at the Appleton Facility – with production increasing from 0.28 million pounds in 1954 to 11.8 million pounds in 1970. (NCR-FOX-0174167.)
460. From 1957 through 1971, over 44 million pounds of PCBs were used in the manufacture of NCR Paper. (GLTFOX00001900, at 901.)

**X. AUGUST 1971 WAS THE EARLIEST DATE THAT ANY OF THE DEFENDANTS KNEW THAT NCR PAPER PREVIOUSLY, BUT NO LONGER, CONTAINED PCBS.**

**A. Defendants Did Not Use PCBs in Their Paper Products**

461. Except for manufacturers of NCR Paper (ACPC, Combined Locks, Mead, WT, etc.), the paper industry did not use PCBs in their paper products. (NCR-FOX-0159623, at 625.)

**B. NCR, ACPC and Combined Locks Kept Their Use of PCBs Secret**

462. It is undisputed that during the Production Period, NCR kept its recipe to make the PCB-containing emulsion a closely guarded secret. (Dkt. 671 ¶ 31.) NCR's use of PCBs was a trade secret, not available to the public or the Defendants in this action. (Schumaker Dep., 43:20-24 (PCBs in NCR Paper was a "deep, dark secret; and it was protected by

NCR with their lifeblood, and that's an understatement."); Stevens Dep., [44:24-45:15](#); Herbig Dep., [74:19-75:17](#); [API-GE003384](#).) ACPC also did not disclose the presence of Aroclor in the NCR Emulsion.

463. Marcia Williams, NCR's expert, interviewed former ACPC/NCR employees in 2005 about whether the presence of PCBs was widely known outside of NCR. ([NCR-FOX-0592816](#).) Those employees who had an opinion believed that this information was not well known until the time that PCBs became a public focus, and by that time, NCR had ceased its use of PCBs. ([NCR-FOX-0592816](#), at [831](#), [834](#).) Jerry Taylor, a former NCR and ACPC employee, told Ms. Williams that he "did not believe that brokers were told anything regarding NCR's effort to replace Aroclor." ([NCR-FOX-0592816](#), at [834](#).)
464. A broker who sold broke to some of the Defendants was never told by NCR that the broke may have been coated with PCB emulsion, or was coated with anything harmful to the environment. (Dkt. 659 ¶ [75](#); Golper Dep., [15:22-18:4](#).)
465. The earliest document identified by NCR that NCR claims a Defendant may have seen which stated that NCR Paper contained PCBs is a January 12, 1971 letter from a paper industry group (the American Paper Institute) to members of its Combination Paperboard Division. ([NCR-FOX-334431](#).) There is no evidence that any of the Defendants were members of this Division or received this letter when it was sent.
466. It was not until August of 1971, after the Production Period, that any of the Defendants obtained knowledge that the NCR Paper waste previously had contained PCBs. (Glatfelter's Responses to NCR's First Set of Interrogatories, [No. 7](#); Williams Dep., [92:18-93:9](#).)
467. Numerous NCR employees confirmed that NCR did not disclose the presence of PCBs in its paper until 1971. ([NCR-FOX-0592816](#), at [820](#), (John Stutz: "customers wouldn't have known that [NCR Paper] had previously contained Aroclor until much later and after the replacement had been completed [in 1971]"), [831](#) (Bob Sandberg: knowledge that NCR Paper contained PCBs "would not have been well known until the time that PCBs became a public focus, and by that time, NCR had ceased its use of PCBs"), [831](#) (Jerry Taylor: "did not think it was widely known among brokers and customers that NCR used Aroclor in its [NCR Paper]").)
468. Most of the Defendant recycling mills began sampling their outfalls for PCBs in 1973 or 1974. ([NCR-FOX-0126982](#); Defendant Menasha's Amended Responses to NCR's First Set of Interrogatories, [No. 2](#); Menasha's Responses to API's First Set of Interrogatories, [No. 1](#).)
469. Throughout the relevant time period, Defendants upgraded and modified their on-site waste treatment technologies and were within the industry standards of the time. (Ford Expert Report at [5-8](#).) After 1971, the Defendants continued to upgrade their waste treatment processes, eliminated outfalls to the Lower Fox River, hooked up to POTWs and made other modifications that reduced PCB mass discharged to the Lower Fox River. (*Id.*)

470. In 1975, the co-inventor of NCR Paper, NCR's Lowell Schleicher, wrote an internal memorandum stating "the recycling companies are the innocent victims of circumstances created by carbonless manufacturers which are still a part of the paper industry." (NCR-FOX-0536795.)

**C. P.H. Glatfelter Company: Bergstrom Did Not Learn that NCR Paper Had Contained PCBs until August 1971, when NCR Paper No Longer Contained PCBs.**

471. P.H. Glatfelter Company ("Glatfelter") is a Pennsylvania corporation with its principal place of business in York, Pennsylvania. (Dkt. 298 ¶ 10.)

472. The Bergstrom Paper Company ("Bergstrom") was incorporated in Wisconsin in 1904. (NCR-FOX-0002742, at 763.)

473. In 1979, Defendant Glatfelter acquired the stock of Bergstrom and merged with Bergstrom; Glatfelter was the surviving corporation. (NCR-FOX-0126041, at 041.)

474. In 1904, Bergstrom began to operate an integrated deinking pulp and paper mill ("Bergstrom Mill") in Neenah, Wisconsin, manufacturing fine printing and writing papers from recycled fiber. (GLTFOX00001280, at 281.)

475. The Bergstrom Mill received waste paper primarily from paper manufacturers, coaters, converters, and printers, and made deinked pulp from that waste paper.

476. The Bergstrom Mill generated waste water from its processes. Throughout the relevant period, the Bergstrom Mill treated that waste water and discharged it to Little Lake Butte des Morts ("LLBdM" or "OU 1") at the upstream end of the Lower Fox River Site. The volume of the discharge varied between about 3 million and 4 million gallons per day throughout the relevant period.

477. In 1952, Bergstrom installed primary waste water treatment at the Bergstrom Mill that worked principally to remove solids from the waste water. Bergstrom upgraded its waste water treatment system over the course of the next two decades. (NCR-FOX-0128204; GLTFOX00005040.) Bergstrom placed the removed solids into a landfill known as "Arrowhead Park," adjacent to the Bergstrom Mill and adjacent to Little Lake Butte des Morts. Bergstrom stopped disposing of waste water treatment solids in Arrowhead Park in 1976, moving waste to a nearby landfill. (Shimek Expert Report at 3-4.)

478. Richard W. Wand began as Assistant to the President of Bergstrom in 1965. He became the Vice President–Administration, a position later renamed Administrative Vice President, until 1979. Beginning in 1973, Mr. Wand served on the Bergstrom Board of Directors. During his time as Vice President, all of the environmental functions of the Bergstrom Mill ultimately reported to him.

479. Dedric W. Bergstrom, IV, served as Purchasing Manager of Bergstrom from 1972 until 1979. In that position, Mr. Bergstrom was responsible for purchasing the waste paper recycled in the Bergstrom Mill.

480. Kenneth Voiss worked at Bergstrom from 1955 to 1987. From 1964 to 1979, Mr. Voiss served as Chief Engineer.
481. Robert Swoboda worked at Bergstrom from 1970 to 2003. Beginning in 1970, Mr. Swoboda served as a truck driver at the Bergstrom Mill. From 1975 until his retirement, Mr. Swoboda served as an operator in Bergstrom's waste treatment plant.
482. James S. Haney served as Public Affairs Director and Assistant Counsel for Bergstrom from 1974 to 1979.
483. Orville Ross worked at Bergstrom from 1946 to 1982. Mr. Ross served as Assistant Engineer, Assistant to Production Manager, and Environmental Engineer, Waste Treatment and Water Management.
484. Cecil Hess worked at Bergstrom from 1966 to 1978. He served as Assistant Production Manager, Production Manager, and Vice President of Production. (Hess Dep. (May 13, 2009), [11:11-15](#), [15:9-21](#).)
485. The Bergstrom Mill received waste paper primarily from paper manufacturers, coaters, converters, and printers, and made deinked pulp from that wastepaper.
486. In 1954, the Bergstrom Mill had the capacity to de-ink approximately 75 tons per day of paper and produce 25 tons of paper per day. (GLTFOX00006065, at [077](#).) In 1971, Bergstrom increased the Bergstrom Mill's capacity to 250 tons per day, and in 1974 to 300 tons per day. ([NCR-FOX-0159308](#); [NCR-FOX-0115544](#).)
487. Bergstrom's experience with PCBs began in August 1971, when Ed Gallaher, Bergstrom's Materials Manager, received a copy of a January 1971 memorandum from the American Paper Institute concerning NCR Paper and PCBs at a meeting of wastepaper purchasers. ([NCR-FOX-0159816](#).)
488. The memorandum from the American Paper Institute indicated that PCBs had once been, but no longer were, used in the production of paper.
489. Mr. Gallaher sent the memorandum to Bergstrom's Technical Director, Kenneth Maves, and, one month later, Mr. Gallaher forwarded additional information related to PCBs discovered during a wastepaper meeting to Mr. Maves. ([NCR-FOX-0159816](#).)
490. On September 24, 1971, out of concern about the prior presence of PCBs in NCR Paper, Mr. Maves requested that Mr. Valente, one of Bergstrom's technical department staff workers, investigate what PCBs were, their properties, and whether the presence of NCR Paper broke in the deinking plant would lead to the presence of PCBs in paper produced by the mill. ([NCR-FOX-0141382](#); [GLTFOX00004014](#).)
491. After six months of investigation, Mr. Maves passed his "PCB file" to John Valente, asking Mr. Valente to prepare a memorandum that summarized all that Bergstrom had learned to date regarding PCBs. ([NCR-FOX-0141382](#).)

492. Three weeks later, Mr. Valente sent Mr. Maves a memorandum highlighting research to date and outlining the actions taken by Bergstrom regarding PCBs between August 1971 and April 1972. (NCR-FOX-0159816, at [816-820](#).)
493. Bergstrom learned no earlier than August 1971 that NCR Paper previously had contained PCBs. (Glatfelter's Amended Responses to API's First Set of Interrogatories, [No. 1](#).)
494. PCBs were detected in effluent from the Bergstrom Mill beginning in 1973. (Glatfelter's Amended Responses to API's First Set of Interrogatories, [No. 1](#); [NCR-FOX-0140147](#).)

**D. Georgia Pacific, LLC; Georgia Pacific Consumer Products LP; Fort James Corporation; and Fort James Operating Company ("Georgia-Pacific")**

495. Georgia Pacific Consumer Products LP is a Delaware limited partnership with its principle place of business in Atlanta, Georgia, and was formerly known as Fort James Operating Company. (Dkt. 310 ¶ [28](#).)
496. Georgia-Pacific LLC is a Delaware limited liability corporation with its principle place of business in Atlanta, Georgia. (Dkt. 310 ¶ [28](#).)
497. Fort James Corporation is a Virginia corporation with its principle place of business in Atlanta, Georgia. (Dkt. 310 ¶ [28](#).)
498. The Fort Howard Paper Company was founded in 1919 as a privately owned company producing toilet paper, tissue, napkins, towels and other paper products. In 1997, Fort Howard merged with the James River Corporation to form Fort James Corporation. (NCR-FOX-0114608, at [611](#).)
499. Until the merger with James River Corporation, the only facility Fort Howard operated in Green Bay, Wisconsin, was located at 1919 Broadway Street. (NCR-FOX-0114608, at [611](#).)
500. A significant portion of the pulp Fort Howard used to make its products at the Broadway Street facility is produced by the company in its deinking pulp mill. (NCR-FOX-0213379, at [384](#).)
501. Beginning in the mid-1960s, Fort Howard received NCR Paper "broke" from NCR/API or their predecessors. (NCR-FOX-0213379, at [389](#).) The NCR broke was an extremely small percentage of the paper Fort Howard recycled during the relevant time period. (*Id.*)
502. Fort Howard was never informed by NCR, any NCR Paper producer, or any broker, that NCR Paper contained PCBs. (Georgia-Pacific's Responses to NCR's First Set of Interrogatories, [No. 1](#).)
503. Fort Howard employees may have read articles in the 1970s noting that PCBs had been in NCR Paper. (Schneider Dep., [121:13-122:16](#).) One employee read an article in December 1971. (Schneider Dep., [123:3-124:19](#); NCR-FOX-0107757, at [759](#).) The article mentioned that PCBs had been – but no longer were – in NCR Paper.

504. Fort Howard first learned that its effluent contained low levels of PCBs in approximately September 1974, when the WDNR conducted effluent sampling. (NCR-FOX-0113247, at 251; Schneider Dep., 127:23-128:9; Pagel Dep., 88:7-16; Georgia-Pacific's Responses to NCR's First Set of Interrogatories, No. 4.)
505. In late 1974 and 1975, Fort Howard undertook a comprehensive investigation of the potential sources of PCBs in its effluent, including but not limited to: meeting with Monsanto representatives; meeting with outside laboratories; developing in-house laboratory expertise regarding testing of PCBs; retaining outside laboratories to perform split sample testing; participating in inter-laboratory and round robin PCB analysis; meeting with federal and state government representatives and participating in government efforts to investigate PCBs in the wastepaper industry and Fox River; sampling and PCB analysis of wastepaper, recycled pulp, effluent, process waste water and products, process chemicals, transformer fluids and other materials that could be potential sources of PBCs; and investigating and implementing changes to the plant's waste water treatment system to improve its ability to reduce solids in order to further reduce PCB concentrations in plant effluent. (Georgia-Pacific's Responses to NCR's First Set of Interrogatories, No. 2; GPFOX000104999; API-GF061071; GPFOX00027493; GPFOX00105007; GPFOX00025021; GPFOX00017603.)
506. In 1975, Fort Howard confirmed that NCR Paper had at one time contained PCBs when it contacted representatives of Monsanto as part of a comprehensive investigation to determine the source of PCBs in Fort Howard's effluent. (Georgia-Pacific's Responses to NCR's First Set of Interrogatories, No. 1.) Fort Howard was told by Monsanto that old NCR Paper may still be in office files but that it would be a short-term issue. (GPFOX00104999.)
507. Fort Howard's own investigation, including a wastepaper sampling program, confirmed that pre-1972 NCR Paper contained PCB concentrations in the millions of parts per billion ("ppb") range, and that NCR Paper produced after 1972 had considerably lower concentrations of PCBs. (Georgia-Pacific's Responses to NCR's First Set of Interrogatories, No. 1; GPFOX00019797, at 799-800.)
508. Fort Howard's wastepaper sampling program showed that all wastepaper in its possession contained some levels of PCBs. (Georgia-Pacific's Responses to NCR's First Set of Interrogatories, No. 1; GPFOX00019795, at 798-807.) Fort Howard continued to test samples of its wastepaper annually for decades. Those results consistently showed fluctuating levels of PCBs in all wastepaper grades. Although, Fort Howard's paper testing was initially conducted for internal business purposes, it was eventually shared with the EPA and the WDNR. (NCR-FOX-0213379, at 389; GPFOX00019795, at 797-807; NCR-FOX-0102469, at 473.)
509. Representatives from Fort Howard attended a National Conference on PCBs sponsored by the EPA on November 19-21, 1975, where they learned that PCBs were potentially detrimental to human health. (GPFOX00105007, at 007-008.)

510. As a result of its investigations into PCBs in the mid 1970s, Fort Howard began to acquire some general knowledge about the potential environmental and human health effects of the discharge of PCBs to a waterbody or waste water treatment facility. (Georgia-Pacific's Responses to NCR's First Set of Interrogatories, [No. 5.](#))
511. Fort Howard continued to recycle post-consumer paper grades that could have contained very small quantities of old (PCB-containing) NCR Paper. It was lawful to do so and necessary for Fort Howard's business. (NCR-FOX-0213379, at [389.](#))
512. Fort Howard engaged in extensive efforts in the 1970s, 1980s and 1990s to reduce the PCBs in its effluent to non-detect levels. ([NCR-FOX-0100803](#); [NCR-FOX-0102468](#); [NCR-FOX-102469](#); NCR-FOX-0102365, at [387.](#)) While doing so, Fort Howard met the annual PCB discharge limits set in its Wisconsin Pollution Discharge Elimination System ("WPDES") permit. (Georgia-Pacific's Responses to NCR's First Set of Interrogatories, [No. 4.](#))
513. In 1975, Fort Howard would have been aware that recycling NCR brand carbonless copy paper could result in the discharge of PCBs to a waterbody. (GPFOX00105007, at [007-008.](#))
514. In 1975, Fort Howard knew that PCB discharges to a waterbody or waste water treatment facility could risk environmental damage, including actual or potential adverse impacts to the environment, human health or animal health. (GPFOX00105007, at [007-008.](#))

**E. Menasha Corporation**

515. Menasha Corporation is a Wisconsin corporation with its principal place of business in Neenah, Wisconsin. (Dkt. 293 ¶ [11.](#))
516. Menasha's relationship to the Lower Fox River Site is as a result of its former ownership of John Strange Paper Mill ("JSPM"), which it sold to U.S. Paper in 1983. (Menasha's Amended and Supplemental Responses to NCR's First Set of Interrogatories, [No. 1.](#))
517. Menasha operated the JSPM from 1971 to 1983. (Menasha's Amended and Supplemental Responses to NCR's First Set of Interrogatories, [No. 1.](#))
518. The John Strange Company, which originally owned the JSPM, was merged into Menasha in 1971. (Dkt. 293 ¶ [33.](#))
519. JSPM made paperboard during Menasha's relationship to JSPM. No PCBs are used in making paperboard. Any PCBs in paperboard manufactured by JSPM got into the "furnish" – the raw material used to make the paperboard – by accident. (Menasha's Amended and Supplemental Responses to NCR's First Set of Interrogatories, [No. 1.](#))
520. The JSPM did not accept broke from NCR, API, or any of their predecessors. (Menasha's Amended and Supplemental Responses to NCR's First Set of Interrogatories, [No. 1.](#))

521. The JSPM did not accept converter trim from NCR® Paper forms manufacturers or converting operations. (Menasha's Amended and Supplemental Responses to NCR's First Set of Interrogatories, [No. 1.](#))
522. The JSPM did not have a "deinking" process. (Menasha's Amended and Supplemental Responses to NCR's First Set of Interrogatories, [No. 1.](#))
523. By far, the most abundant source of furnish or feedstock used at JSPM and Menasha consisted of "old corrugated," which was the preferred raw material for the manufacturing of paperboard because it was less expensive than other types of furnish and JSPM made paperboard for use in low grade cardboard products. As stated in the Boxboard Research & Development Association letter, dated September 15, 1971, "Corrugated waste which has jute liners or corrugating medium made from wastepaper could have office waste containing NCR Paper. The amount of corrugated (sic) made with jute test liners is extremely small, so this should not present a significant problem." (Menasha's Amended and Supplemental Responses to NCR's First Set of Interrogatories, [No. 4.](#))
524. Menasha did not learn that NCR Paper contained PCBs before the Fall of 1971. (Menasha's Amended and Supplemental Responses to NCR's First Set of Interrogatories, [No. 1](#); [MENFOX00001640](#); [MENFOX00001723](#); [MENFOX00001725](#); Sattler Dep., [56:23-58:6](#); Austin Dep., [104:2-105:7.](#))
525. After information was first published in 1971 that NCR was the cause of all PCBs in paper stock, and as a result of concerns expressed that PCBs could be inadvertently getting into production through process water from lakes and streams containing PCBs ([MENFOX00000149](#)), Menasha tested the intake water from the JSPM, which is drawn from the Lower Fox River, and its paperboard for PCBs in the Fall of 1971. (Menasha's Amended and Supplemental Responses to NCR's First Set of Interrogatories, [No. 3.](#))
526. Testing of JSPM effluent for PCBs began in 1973; and, in 1973, very low levels of PCBs were measured at an outfall at JSPM. (Menasha's Amended and Supplemental Responses to NCR's First Set of Interrogatories, [No. 3.](#))
527. In 1973, Menasha would have been aware that recycling NCR brand carbonless copy paper could result in the discharge of PCBs to a waterbody or a waste water treatment facility. (Menasha's Amended and Supplemental Responses to NCR's First Set of Interrogatories, [No. 3.](#))
528. Sometime after 1973, it is clear that Menasha knew that PCB discharges to a waterbody or waste water treatment facility could risk environmental damage, including actual or potential adverse impacts to the environment, human health or animal health. (Menasha's Amended and Supplemental Responses to NCR's First Set of Interrogatories, [No. 5.](#))

**F. U.S. Paper Mills Corporation**

- 529. U.S. Paper Mills Corporation (“U.S. Paper”) is a Wisconsin corporation with its principle place of business in De Pere, Wisconsin. (Dkt 283 ¶ 27.)
- 530. U.S. Paper operated a mill in De Pere, Wisconsin that recycled wastepaper during the relevant time period (the “De Pere Mill”). (Dkt. 283 ¶ 49.)
- 531. U.S. Paper later purchased the JSPM from Menasha in 1983 and thereafter operated it. (Dkt. 283 ¶ 49.)
- 532. U.S. Paper’s De Pere Mill employed only about 40 people, spread among three shifts, who operated one paper machine that made approximately one to one and one half truckloads of paper core stock per day, which was used mainly to make the cores of toilet paper and paper toweling.
- 533. The De Pere Mill produced primarily brown core stock using as furnish bales of old corrugated paper and mixed waste paper, which was made up of old corrugated and other unsorted waste paper.
- 534. By the late 1960s, U.S. Paper also produced a small amount of white core stock using envelope cuttings, ledger papers, broke from Appleton Coated Paper Company and sorted mixed office waste which may have included some NCR Paper. The sorted mixed office waste, NCR broke and other white grades of waste paper used in the white core stock was more expensive than the corrugated and mixed paper used by US Paper to make its brown core stock.
- 535. U.S. Paper's De Pere mill did not produce paper used in food packaging.
- 536. U.S. Paper did not hold memberships in the American Paper Institute, or the Boxboard Research and Development Association (BRDA), or any association specific to the paperboard industry.
- 537. Plaintiffs never informed U.S. Paper that the NCR Paper, broke, and trim made by Plaintiffs contained PCBs.
- 538. U.S. Paper was not informed of the presence of PCBs in NCR Paper during the 1960s or 1970s.
- 539. There is no evidence that U.S. Paper ever knew that Plaintiffs' NCR Paper contained PCBs in the relevant time period.
- 540. In 1973, U.S. Paper retained consultants to assist with compliance with Wisconsin’s reporting requirements under NR 101. ([USPFOX00000066](#); [USPFOX00000198](#).)
- 541. In the 1974 analytical report from Foth & Van Dyke, U.S. Paper’s effluent was analyzed for PCBs and found to contain less than 0.0001 mg/l (non-detect). ([USPFOX00000066](#), at [068](#).)

542. Tests on U.S. Paper's effluent performed by environmental engineering firms retained by U.S. Paper starting in 1973 did not detect any PCBs in U. S. Paper's effluent and, therefore, U.S. Paper had no reason to suspect the presence of PCBs in its process. (USPFOX00000210; USPFOX00000066, at 068; USPFOX00000053; USPFOX00000054; USPFOX00000055; USPFOX00000056; USPFOX00000057; USPFOX00000058.)
543. U.S. Paper was not aware that its recycling of NCR Paper broke, trim or mixed waste paper may have resulted in PCBs being discharged to a water body or waste water treatment plant prior to receiving a PRP notice from the U.S. Fish and Wildlife Service in 1994.

#### **G. Neenah-Menasha Sewerage Commission: 1975**

544. In 1935, the Wisconsin legislature created metropolitan sewerage districts ([Wis. Stat. § 66.20\(1\) \(1935\)](#)) and sewerage commissions ([Wis. Stat. § 144.07 \(1935\)](#)) and required them to provide sewerage service within their service areas.
545. Since 1937, the Neenah-Menasha Sewerage Commission ("NMSC") has operated a municipal waste water treatment plant in Menasha, Wisconsin (the "NM POTW"). (Dkt. 261 ¶¶ 25, 47.) PCBs adsorb to solids. (Ford Expert Report at 6-7.) The NM POTW provided primary treatment since its creation that removes solids (and thus PCBs). (*Id.*)
546. NMSC did nothing in its process or treatment of influent that introduced PCBs into the waste water it discharged. (NMSC's First Supplemental Answers to API's First Set of Interrogatories, [Nos. 8, 14.](#))
547. NMSC learned that PCBs might be in its effluent on November 21, 1975, from an article in the *Milwaukee Sentinel* reporting on a speech given by the WDNR employee Stanton Kleinert regarding PCBs in Lake Michigan. ([NMSC\\_FOX\\_000599.](#)) The article quoted the WDNR employee as saying, "a large part of the PCBs getting into Lake Michigan comes from the discharges of municipal sewerage treatment plants at Sheboygan, Neenah-Menasha, and Milwaukee." ([NMSC\\_FOX\\_000601.](#))
548. NM POTW Manager-Engineer, Robert Bues, immediately wrote a letter to the WDNR stating, "I am concerned with Mr. Kleinert's statement for the following reasons:
1. The only record the Neenah-Menasha Sewerage Commission had as of November 21, 1975, of DNR or EPA testing results of our plant discharges for PCB's (sic) is a report of **one sample taken on March 28, 1972** which indicates an effluent level of 3.3 parts per billion. Based on a typical 16 million gallon per day discharge from our plant, **a total of 0.44 pounds per day** of PCB's (sic) were discharged. We did not have official results of further testing done by the DNR on our effluent, until November 24, 1975, when **an October 16, 1974 test was noted**. This 1974 test established 0.16 parts per billion of PCB's (sic) in our effluent, **a total of 0.017 pounds per day** in a 12.75 million gallon discharge. If further testing was done, and if a federal or state agency were aware of a situation involving us as a significant

part of the overall pollution problem affecting Lake Michigan, we should have been officially advised of the results and conclusions of such testing programs associated with our plant. **Mr. Kleinert's statements contained in a news article, which were certainly uncomplimentary, were our first exposure to the DNR's position on this subject** and we question whether the quote is accurate, either in fact or as a reporting of Mr. Kleinert's statement.

2. We have discussed PCB's (sic) informally, severally times over the past few years, as a matter of mutual professional interest with the DNR. As late as September 25, 1975, **we requested the DNR, at our own initiative, to make periodical tests for PCB's (sic) in our effluent.** This request was motivated by news articles pointing out high levels of PCB's (sic) detected in the discharges of paper recycling industries. We were advised that the DNR had continuous monitoring programs to detect PCB's (sic) in various municipal and industrial discharges to the Fox River, however, **sampling at the Neenah-Menasha Sewerage Commission plant had been phased out** and discontinued due to our **insignificantly low level of PCB discharges.** We asked if periodical checks could be made on our discharges, at our request, for verification purposes, however, the DNR declined stating that our plant had been eliminated from the PCB testing program due to **minimal PCB concentrations in our plant effluent** and that further tests were not called for." ([NMSC\\_FOX\\_000599](#) (emphasis added).)
549. Bues requested that the WDNR "immediately attempt to determine whether, based on current information, it can be concluded that the Neenah-Menasha Sewerage Commission has, in the past, or is now in fact, contributing a large portion of the PCB pollutants into Lake Michigan, as testified." ([NMSC\\_FOX\\_000599](#), at [600](#).)
  550. The WDNR Acting Assistant Secretary, Thomas Frangos, responded to Bues' letter and included a copy of Kleinert's report. Frangos stated, "In reading this report, I think you will agree that the Neenah-Menasha treatment plant is not cited as a major contributor of PCBs to Lake Michigan." The WDNR did not suggest directly or indirectly that the NM POTW had any role in generating PCBs or should take any action. ([NMSC\\_FOX\\_000603](#); [NMSC\\_FOX\\_000604](#).)
  551. The first mention of PCBs in an NMSC WPDES permit came in the 1992 permit that listed PCBs among the twenty-one substances for which the NM POTW was required to test. ([NMSC\\_FOX\\_005223](#), at [240](#)), and for which NMSC tested and received non-detect results, ([NMSC\\_FOX\\_000335](#); [NMSC\\_FOX\\_000336](#); [NMSC\\_FOX\\_000337](#)), or less than the detection limit, ([NMSC\\_FOX\\_000468](#); [NMSC\\_FOX\\_000470](#)).
  552. No employee of the Plaintiffs or the Defendant paper recycling mills ever discussed PCBs with NMSC or a NM POTW employee. (Ford Expert Report at [28](#); Aber Dep., [49:20-50:3](#); Balster Dep., [188:25-189:16](#); Bergstrom Dep., [215:6-12](#); Bodmer Dep., [207:15-208:24](#); Brockett Dep., [75:19-25](#); Ellis Dep., [124:17-24](#); Gallagher Dep., [130:23-131:1](#); Gallaher Dep., [90:17-91:1](#); Graves Dep., [77:5-12](#); Herbig Dep., [235:14-22](#); Hess Dep., [226:13-23](#); Hultgren Dep. (March 18, 2009), [90:2-22](#); Juedes Dep., [137:5-16](#);

Kresch Dep., [165:12-25](#); Lee Dep., [175:14-23](#); McIntosh Dep., [165:18-8](#); Morton Dep., [208:22-209:3](#); Natrop Dep., [79:10-18](#); Nelson Dep., [106:25-107:4](#); Powell Dep., [174:4-9](#); Ross Dep. (May 28, 2009), [261:23-262:5](#); Sarosiek Dep., [139:16-140:7](#); Schwab Dep., [164:23-165:1](#); Sipple Dep., [104:11-18](#); Stutz Dep. (July 1, 2009), [243:13-23](#); Suess Dep., [76:6-11](#); Sugden Dep., [96:8-12](#); Swoboda Dep., [122:9-15](#); Tallmadge Dep., [109:13-16](#); Gerald Taylor Dep., [261:4-19](#); Gordon Taylor Dep., [283:11-15](#); Voiss Dep., [180:7-13](#); Walraven Dep., [106:16-19](#); William West Dep., [101:12-16](#).)

#### **H. CBC Coating Inc., Riverside Paper Corporation (“Riverside Paper”)**

- 553. CBC Coating, Inc. is a Wisconsin Corporation with its principal place of business in Appleton Wisconsin, and is the successor to Riverside Paper Corporation (“Riverside Paper” or “Riverside.”) (Dkt. 265 ¶ [29](#); Dkt. 327 ¶ [29](#).)
- 554. Riverside Paper owned and operated a paper production facility located in Appleton, Wisconsin (the “Riverside Paper Mill”). (Dkt. 327 ¶ [51](#).) From 1967 to 1981, Riverside’s production on its two paper machines ranged from approximately 93 tons of paper per day to 106 tons per day. ([CBCFOX00005618](#), at [619-633](#).)
- 555. Riverside Paper Mill produced paper products including bond paper, writing paper, construction paper, and other school, business and specialty papers. (Holzknecht Dep., [43:18-44:19](#); Aber Dep., [14:1-23](#).)
- 556. A March 13, 1972 letter from Pioneer Paper Stock, found in Riverside Paper’s files, indicated that PCBs previously had been used in the manufacture of carbonless copy paper. Riverside was not a “Paper Stock Supplier” of Pioneer Paper Stock, which was the group to whom the letter was addressed. The copy of the letter found in Riverside’s files does not indicate when Riverside received the letter; rather, a now-deceased former Riverside employee’s name is handwritten in the margin of the copy of the letter. A former Riverside employee who recalls having seen the letter does not recall when he saw it. ([CBCFOX00003773](#); Holzknecht Dep., [163:23-166:24](#).)
- 557. Riverside Paper first detected PCBs in its waste water discharged to the Appleton POTW in December 1974, and did not detect PCBs in its waste water again until December 1979. (CBC’s Amended and Supplemental Answers to NCR’s First Set of Interrogatories, [No. 1](#); Holzknecht Dep., [156:9-19](#); [CBCFOX00003598](#).)

#### **I. WTM I Company (f/k/a Wisconsin Tissue Mills)**

- 558. WTM I Company (“WTM I”) is a Delaware corporation with its principal place of business in Richmond, Virginia. (Dkt. 300 ¶ [26](#).) Until the company changed its name in September 2000, WTM I was known as Wisconsin Tissue Mills Inc. (“Wisconsin Tissue”).
- 559. Wisconsin Tissue owned and operated a tissue paper mill in Menasha, Wisconsin. (Dkt. 300 ¶ [48](#).)

560. Wisconsin Tissue was never advised by NCR or ACPC of the presence of PCBs in NCR Paper while PCBs were used in the emulsion formula. (WTM I's Responses to NCR's First Set of Interrogatories and Requests for Production of Documents, [No. 1.](#))
561. In February 1975, Wisconsin Tissue's effluent testing showed the presence of PCBs for the first time. Wisconsin Tissue began testing its effluent for PCBs, and other constituents as required by NR 101, beginning in 1973. ([WTMFOX00007631](#); [NCR-FOX-0281244](#), at [245](#); [NCR-FOX-0281348](#); [NCR-FOX-0281350](#); [NCR-FOX-0283372](#).)
562. Wisconsin Tissue first learned that NCR Paper contained PCBs sometime in July 1975, through conversations with personnel at Bergstrom and Fort Howard. (WTM I's Responses to API's First Set of Interrogatories, [No. 1](#); [WTMFOX00009280](#), at [281](#).)

#### **J. The City of Appleton**

563. The City of Appleton is a Wisconsin municipal corporation organized under the laws of the State of Wisconsin, with its principal place of business located in Appleton, Wisconsin. (Dkt. 258 ¶ [19](#).)
564. The City of Appleton POTW ("Appleton POTW") was constructed beginning in 1935, and there were upgrades in about 1965 and 1978. (City of Appleton's Amended Responses to API's First Set of Interrogatories, [No. 2](#).)
565. The City of Appleton was legally required to accept influent from all sources within the City's sewer service area including ACPC, NCR, and Riverside Paper. (City of Appleton's Amended Responses to API's First Set of Interrogatories, [Nos. 14-19](#).)
566. ACPC and NCR discharged process waste water to the Appleton POTW during and after the Production Period, although these discharges of PCBs ended at the end of the Production Period.
567. Neither ACPC nor NCR ever told anyone at the City of Appleton or Appleton POTW that PCBs were used in NCR Paper or that its waste water contained or had contained PCBs.
568. In April 1968, the City of Appleton sent an Industrial Waste Survey to the Appleton Facility, asking if it had any tests of waste water quality or had any unusual wastes or conditions. ACPC responded, "No." ([COA-FOX-00020224](#), at [225](#).)
569. A similar survey was sent out on October 1970 to ACPC (or NCR), this time asking about the amounts and kinds of chemicals used by each discharger. ACPC responded to that inquiry by stating, "Miscellaneous." ([COA-FOX-00006031](#), at [031](#).)
570. The October 1970 survey asked the Appleton Facility whether it had "any near term plans for new products resulting in difference (sic) or added wastes" and the response was "No," notwithstanding the then on-going efforts to replace the PCBs in the NCR Emulsion. ([COA-FOX-00006031](#), at [031](#).)

571. The production of NCR Paper using NCR Emulsion ended at the Appleton Facility in early 1971, and, as a result, the PCBs in its process waste water sent to the Appleton POTW essentially ended.
572. The first WDNR analysis of a sample of Appleton POTW effluent taken on April 24-25, 1972, showed PCB concentrations of 1.4 and 0.9 ppb. A second sample taken on February 15, 1972, showed PCB concentrations of 0.26 ppb. (COA-FOX-00006897, at [898](#); COA-FOX-00003703, at [708](#).)
573. Although the WDNR tested the effluent of the Appleton POTW for PCBs in 1972, it did not provide any notification of the results to the City of Appleton and did not request that the City of Appleton take any action in response to the test results.
574. Until at least the mid-1970s, there were no regulatory requirements to remove PCBs from influent and the regulatory agencies did not ask the City of Appleton to remove PCBs from its effluent. (City of Appleton's Amended Responses to API's First Set of Interrogatories, [No. 7](#).)
575. The City's WPDES permits for 1974 and 1979 did not have any effluent limit for PCBs. (COA-FOX-00022952, at [952-966](#); COA-FOX-00023037, at [037-058](#).)
576. The Appleton POTW never experienced a plant upset attributable to the presence of PCBs in its influent.
577. The Appleton POTW did nothing in its process or treatment of waste water that introduced PCBs into the waste water it discharged. (City of Appleton's Amended Responses to API's First Set of Interrogatories, [Nos. 14-19](#).)
578. The City of Appleton had no knowledge that PCBs were used in NCR Paper at any time during the Production Period. (City of Appleton's Amended Responses to API's First Set of Interrogatories, [Nos. 5, 14-19](#).)
579. The City of Appleton did not know that PCB discharges to a waterbody could cause environmental or human health risks at any time during the Production Period. (City of Appleton's Amended Responses to API's First Set of Interrogatories, [Nos. 9, 14-19](#).)

**K. The United States Government**

580. By no later than April 1972, the United States Government knew that recycling NCR Paper would result in the discharge of PCBs to a waterbody, thereby risking environmental damage. ([GPFOX00033019](#); Brigham Expert Report at [16-17, 19](#); United States' Responses to Menasha's First Set of Requests for Admission, [No. 12](#); NCR-FOX-0563271, at [295](#).)

**XI. THE UNITED STATES GOVERNMENT AND THE STATE OF WISCONSIN  
BALANCED THEIR DESIRE TO PROMOTE THE CONTINUED RECYCLING  
OF NCR PAPER AGAINST THE ENVIRONMENTAL RISKS POSED BY PCBs**

581. In the 1970s, the EPA implemented programs to promote recycling based on its many environmental benefits. (Dkt. 659 ¶ 115.) The congressional policy statement in the National Environmental Policy Act (“NEPA”) has as one of its goals, to “enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.” (Dkt. 659 ¶ 116.)
582. On or about December 18, 1972, the FDA publicly stated that prohibiting all PCB-containing paper in food-packaging material regardless of level of PCB contamination “would also have an adverse impact on recycling programs that would outweigh the beneficial effects, if any, that could be gained by a complete prohibition on the use of salvaged or reclaimed paper that contains low levels of PCBs.” (MONSFOX00041552, at 578.)
583. In 1975, the Wisconsin legislature passed Assembly Bill 1342, which prohibited the manufacture and purchasing for use of PCBs, but expressly exempted the recycling of paper containing PCBs from its prohibition. (Dkt. 659 ¶¶ 105-106; GPFOX00005646, at 646-647.) Assembly Bill 1342 required the WDNR to adopt rules governing the disposal of PCBs and PCB-containing products which exempted “the manufacture or sale of recycled paper products to which PCBs have not been intentionally added during or after manufacture for any of the uses set forth in sub (1)(c).” (Dkt. 659 ¶ 107; GPFOX00005646, at 647.) Assembly Bill 1342 also provided that “[n]othing in this section shall exempt any person from applicable disposal or discharge limitations required or authorized under other sections of the statutes.” (Dkt. 659 ¶ 107; GPFOX00005646, at 647.)
584. On May 31, 1979, in prohibiting the manufacture, processing and distribution of PCBs, the EPA determined:

[E]xisting PCB carbonless copy paper may be used indefinitely. . . . There does not appear to be a way to distinguish PCB carbonless copy paper from non-PCB carbonless copy paper except perhaps by dates or other indications on unused inventories. A large portion of the PCB carbonless copy paper that has not been destroyed is probably in files. An enormous undertaking would be required of both business and government to purge existing files of PCB carbonless copy paper. Moreover, the amount of PCB on each sheet of carbonless copy paper is extremely small. In view of these practical considerations and because the potential PCB exposure and risks to human health or the environment are negligible, EPA has concluded that this activity does not present an unreasonable risk and is authorizing the continued use of existing PCB carbonless copy paper.

(NCR-FOX-0601707, at 724; Dkt. 659 ¶ 112.)

585. Also in 1979, the EPA determined that continued use of PCB-containing carbonless copy paper did not present an unreasonable risk. (Dkt. 659 ¶ 112.)

## **XII. DEFENDANTS TOOK REASONABLE ACTIONS UPON LEARNING OF THE HARMS FROM RECYCLING NCR PAPER**

### **A. In the 1970s the Cow Had Left the Barn, Escorted Out by NCR and ACPC**

586. After NCR switched from Aroclor to MIPB in 1971, it was not possible to tell the difference between NCR Paper made with PCBs from NCR Paper made with MIPB. (NCR-FOX-0592816, at 817.)

587. NCR understood at least as early as 1972 that: “There does exist in the field a certain residual amount of NCR [P]aper containing Aroclor. This is in the inventory of jobbers and printers throughout the country. It is considered almost impossible to determine the quantity and location of such stock.” (NCR-FOX-350912, at 919.)

588. Removing PCB-containing material from post-consumer sources was not feasible because it was mixed with a large volume of other paper and there was no system for removing the small amount of PCB-containing paper. (Klass Expert Report at 5, 17-19, filed at 578-6 at 11, 23-24.) Indeed, a report prepared for NCR by Alan J. Kresch in August 1976 concludes: “There is no practical method of separating the ‘contaminate’ paper from the rest (other recycled papers may also contain PCBs as an ink component).” (NCR-FOX-0537018, at 020.)

589. In April of 1972, the EPA stated that residue from PCB-containing wastepaper would decline within a period of several months. (PHGNCR-2001233.)

590. In June of 1972, NCR recognized that old PCB-containing NCR Paper would be present in office waste for 3-5 years. (MENFOX00000228.)

591. In February of 1975, Monsanto assured Fort Howard that PCBs in mill effluents would naturally be reduced as NCR Paper was used up and purged from the pipeline. (GPFOX00104999.)

592. Testing conducted by Fort Howard in 1975 and 1976 revealed that all grades of wastepaper, not just NCR Paper, contained PCBs at levels well above 5ppm. (GPFOX00019795, 798-812.) Not a single grade of paper was free from PCB contamination. (*Id.*)

593. Bergstrom also conducted tests on wastepaper in 1975 and 1976 revealing that all grades of wastepaper contained PCBs. (*See, e.g.*, NCR-FOX-0140147; GLTFOX00002189, at 192-195; NCR-FOX-0141252; NCR-FOX-0141223; NCR-FOX-0160201; NCR-FOX-0275527; NCR-FOX-0160119; NCR-FOX-0140720.) On July 6, 1977, NCR reported to the EPA sample results of its carbonless copy paper produced after the Production Period, which found PCBs in the paper. (NCR-FOX-353202, at 203.) NCR’s explanation for PCBs in its carbonless copy paper produced in 1977, after the Production Period, was: “Since PCBs are ubiquitous in the environment in trace quantities and have a propensity

to adsorb on cellulose, it is possible that individual samples of our products manufactured after this date may contain trace quantities (less than 5 ppm) arising from uncontrollable contamination of the raw materials and water supply used in their manufacture before entering our plant.” (NCR-FOX-353202, at [202](#).)

594. In 1979, in a publication entitled, “EPA’s Final PCB Ban Rule: Over 100 Questions & Answers To Help You Meet These Requirements,” the EPA stated that “[b]ecause the amount of PCB on each sheet is extremely small and no inexpensive method of separating PCB from non-PCB carbonless paper has been developed, EPA has authorized the use of existing PCB carbonless copy paper indefinitely.” (GPFOX00075902, at [924](#).)

**B. Defendants’ Waste Water Treatment Practices Were Reasonable and Appropriate for the Times**

595. Each of the Defendant paper recycling mills worked with the WDNR to develop reasonable and appropriate systems within a reasonable timeframe. Several of the Defendant paper recycling mills continued to discharge to a POTW that employed primary and secondary waste water treatment methods that were consistent with the industry standards for POTW at that time. ([NMSC\\_FOX\\_003953](#) (JSPM); NCR-FOX-0280861, at [862-863](#) (WTM I).) Other mills began to discharge to a POTW that employed primary and secondary waste water treatment methods that were consistent with the industry standards for POTW at that time. ([NCR-FOX-0058354](#) (Riverside); [USPFOX00000074](#) (U.S. Paper).) As to on-site treatment at the Defendant paper recycling mills’ facilities, the Defendants chose superior systems for waste water treatment in general, which also had the effect of reducing PCBs, even if the Defendant was unaware of PCBs in its effluent due to its lack of knowledge that PCBs were contained in NCR Paper. ([GPFOX00020343](#) (Georgia-Pacific); [NCR-FOX-0124375](#) (Bergstrom).)
596. Most of the recycling mills and waste water treatment plants began sampling their outfalls for PCBs in the early 1970s. ([NCR-FOX-0126982](#); Glatfelter’s Responses to NCR’s First Set of Interrogatories and Requests for the Production of Documents, [Nos. 7-11](#); Glatfelter’s Amended Responses to API’s First Set of Interrogatories to Glatfelter, [Nos. 7-8](#); Georgia-Pacific’s Responses to NCR’s First Set of Interrogatories and Requests for Production of Documents, [Nos. 7-8](#); Responses of WTM I to API’s First Set of Interrogatories and Requests for the Production of Documents, [Nos. 5-6](#); WTM I’s Responses to NCR’s First Set of Interrogatories and Requests for the Production of Documents, [Nos. 5-6](#); Menasha’s Amended and Supplemental Responses and Objections to NCR’s First Set of Interrogatories and Requests for the Production of Documents, [Nos. 1-2](#); U.S. Paper’s Responses to NCR’s First Set of Interrogatories and Requests for the Production of Documents, [No. 6](#).)
597. By 1967, each of the Defendants which allegedly recycled NCR Paper during that time discharged to a POTW that had primary treatment, or had primary treatment or its equivalent at its facility. ([NMSC\\_FOX\\_003953](#); NCR-FOX-0280861, at [862](#); [NCR-FOX-0162131](#); [NCR-FOX-0153754](#); [GPFOX00020330](#); Ford Expert Report at [6-7](#).)

598. Before 1972, each of the Defendant paper recycling mills employed waste water treatment methods that were reasonable and appropriate for the paper industry at that time. (Ford Expert Report at [5](#).)
599. After 1971, a small amount of PCB-containing paper would have remained in the wastepaper stream from post-consumer sources. ([GPFOX00104999](#).)
600. Because PCBs adsorb to sludge with organic solids, including “fiber fines” in paper mills, Defendant recycling mills’ efforts to reduce Biological Oxygen Demand (“BOD”) and Total Suspended Solids (“TSS”) had the effect of reducing PCBs, though the mills were not aware of this until after they became aware that PCBs were in NCR Paper. (GPFOX00005128, at [188-190](#); [MENFOX00003852](#); Ford Expert Report at [6](#).)
601. In 1968, the State of Wisconsin held hearings to investigate alleged pollution of the surface waters of the Lower Fox River and its tributary basins. Following the hearings, the State issued orders requiring companies to construct adequate treatment facilities or connect their waste water discharges to POTWs, and established a timeline focused on limiting TSS and BOD discharges that applied to recycling mills, in most instances beginning in 1976. (GLTFOX00002475.)
602. In 1977, when the EPA finalized effluent standards for PCBs and exempted the pulp and paper industry, 42 Fed. Reg. 6532, the EPA found that the entry of PCBs into the paper industry was completely unintentional; that the industry responded well to the need for reduction of PCB levels in food packaging; and, that the waste treatment for TSS removal would significantly reduce PCB discharges from the industry. ([NCR-FOX-0530153](#).)
603. The vast majority of PCBs in mill waste water were removed by pre-treatment, primary treatment systems, or both. (Ford Expert Report at [6-7](#).)
604. Limited additional TSS reductions were achieved by the mills through secondary biological synthesis (use of BOD to produce biomass), which further reduced PCBs in effluent. (Ford Expert Report at [7](#).)
605. Each of the Defendant paper recycling mills also used fiber-recovery systems, including side hill screens, save-alls, and Dorr-Oliver systems or the equivalent. These fiber recovery systems removed significant amounts of solids from the mill’s effluent and, in turn, reduced the amount of PCBs in the effluent. (NCR-FOX-0115473, at [506](#), [510](#), [519](#); GLTFOX00002476, at [478-482](#), [486](#); Ford Expert Report at [7](#).)
606. The Defendant paper recycling mills that learned that PCBs were in their effluent took reasonable and appropriate measures to improve their waste water treatment systems. While the approaches taken by the Defendant paper recycling mills varied, each Defendant paper recycling mill was within the standard of care for the industry at the time. (Ford Expert Report at [7-8](#).)

**C. The Bergstrom Mill and Arrowhead Park Landfill (P.H. Glatfelter)**

**1. Bergstrom acted fast, and took appropriate steps to investigate PCBs.**

- 607. In late September or early October 1971, Mr. Maves asked NCR's Appleton Division for samples of NCR Paper containing PCBs so that Bergstrom could compare the use of PCBs in NCR Paper broke in a scientific investigation. ([NCR-FOX-0159613](#).)
- 608. On October 6, 1971, Floyd Strelow of NCR's Appleton Division wrote a letter to Mr. Maves, providing to Bergstrom NCR Paper produced prior to June 1971, the date that Mr. Strelow indicated NCR stopped using PCBs in NCR Paper. ([NCR-FOX-0159612](#).)
- 609. Bergstrom immediately focused on understanding the source of PCBs to its mill.
- 610. Bergstrom first investigated whether any product produced at its mill might come into contact with food, and found that none would.
- 611. Bergstrom then investigated whether handling paper produced at the Bergstrom Mill might present a health hazard.
- 612. Bergstrom sampled the pre-June 1971 NCR Paper and a variety of grades of paper produced by its mill.
- 613. The first phase of PCB sampling involved sampling of seven recently produced grades of paper. (NCR-FOX-0159816, at [818-819](#).)
- 614. Bergstrom also tested three additional samples of NCR Paper manufactured before 1971: a sample of the broke itself, a sample of a "hand sheet" of paper formed from fibers of the deinked broke, and a third sample from another hand sheet formed after deinking and then bleaching the paper. Results indicate that PCBs were present at a concentration of 1600 ppm on paper received from Appleton, 1500 ppm after deinking and 800 ppm after deinking and bleaching. ([NCR-FOX-0159614](#); NCR-FOX-0159816, at [819](#).)
- 615. Results of analyzing seven samples of paper produced by Bergstrom revealed low PCB content, with PCB concentrations in the produced paper ranging from 1 to 17 ppm with an average of close to 6 ppm. (NCR-FOX-0159816, at [818-819](#).)
- 616. This testing program revealed to Bergstrom employees that paper produced by Bergstrom contained PCBs at a concentration that was approximately 1,000 times lower than the NCR Paper. (NCR-FOX-0159816, at [818-819](#).)
- 617. A second round of testing on those same grades of produced paper in early 1972 yielded lower concentrations across the board. ([NCR-FOX-0159621](#).)

618. Continued sampling revealed a significant decrease in the PCB concentrations of produced paper from 1972 to 1974, with levels of 1 to 6 ppm, and average concentrations of approximately 2 ppm. ([NCR-FOX-0140937](#).)
619. In the early 1970s, Bergstrom recycled a minimal amount, if any, of waste paper that had gone to the ultimate consumer and then come back to the recycling stream (“post-consumer paper”). The Bergstrom Mill relied almost exclusively on “post-industrial” – that is, pre-consumer–waste paper.
620. In 1971, Bergstrom officials evaluated the potential sources of PCBs to the Bergstrom Mill. The only sources of wastepaper to the mill at the time were “post-industrial,” or materials from the production or converting of NCR Paper, not post-consumer waste. The PCB-containing scrap from producing or converting NCR Paper produced prior to June 1971 should have already passed largely or entirely through the recycling stream, and so Bergstrom reasonably did not anticipate that PCBs would continue to contaminate the wastepaper coming in to the Bergstrom Mill.
621. Based on the information available at the time, Bergstrom officials appropriately concluded that PCBs from NCR Paper produced before June 1971 would not be part of the future recycled paper waste stream coming into the Bergstrom Mill.
622. Bergstrom's PCB research program extended to waste water sampling in July 1973. ([NCR-FOX-0140085](#); [NCR-FOX-0140086](#), at [085-090](#).) Initial results revealed several samples in which PCBs were not detected, and one 1.6 ppb in Bergstrom’s main outfall. ([NCR-FOX-0140147](#).)
623. Bergstrom sampling performed in 1974 yielded PCB concentrations of 8 ppb. ([NCR-FOX-0140147](#).)
624. In 1975, NCR informed Bergstrom that PCBs from old NCR Paper was expected to come into mills at a declining rate and to be minimal in quantity. ([NCR-FOX-0162136](#).)
625. Efforts of Bergstrom Mill employees to address PCBs were undertaken throughout the 1970s with the understanding that PCBs were no longer contained within the broke sold by NCR, or the converter trim coming from converters of NCR Paper.
626. In 1975, Mr. Wand attended a conference on PCBs. Following that conference, Mr. Wand directed a comprehensive investigation and testing of all potential sources of PCBs from the Bergstrom Mill to the environment. He also directed an effort to reduce or eliminate PCBs from Bergstrom’s products and effluent stream. ([NCR-FOX-0163341](#).)
627. At the 1975 conference, Mr. Wand learned of the term “bioaccumulation,” and came to understand that it meant that the PCBs released into the environment could accumulate in the fatty tissue of fish.
628. Bergstrom expanded its testing program to investigate potential PCB losses from sludge. ([GLTFOX00004049](#).)

629. Bergstrom sampled sludge in 1976, and the analysis of that sludge showed PCBs present at a concentration of 7.2 ppm. ([NCR-FOX-0160479](#).)
630. Bergstrom undertook investigation into whether PCBs might leach from sludge. ([GLTFOX00004049](#).)
631. A September 1, 1977 report from the Institute of Paper Chemistry demonstrated that there was negligible (0.2%) leaching of PCBs from sludge at Bergstrom. ([NCR-FOX-0239386](#).)
632. Bergstrom investigated whether the Bergstrom Mill might be generating PCBs in its bleaching process. Bergstrom conducted extensive testing of this hypothesis. (NCR-FOX-0140105, at [105-112](#).)
633. Bergstrom spent over \$30,000 on this investigation, and conducted a series of tests which confirmed that Bergstrom did not generate PCBs in its bleach plant. ([NCR-FOX-0141386](#).)
634. The Institute for Paper Chemistry ran similar experiments that, like Bergstrom's, did not find the generation of PCBs during papermaking processes. ([NCR-FOX-0239386](#); [GLTFOX00000319](#), at [320-321](#); [NCR-FOX-0159823](#).)
635. Bergstrom tested toner, inks, and hydraulic fluids to determine whether other processes at the mill utilized any other sources of PCBs, and found that they did not. (NCR-FOX-0163035, at [036](#).)
636. Bergstrom explored whether it had ever experimented with the use of PCBs to produce a watermark, and found no evidence that it had. (NCR-FOX-0163035, at [036](#).)
637. Bergstrom built retentive concrete berms around electrical transformers to prevent any inadvertent spill of fluid from reaching a drain.
638. Bergstrom continued its efforts to reduce suspended solids in its effluent. ([GLTFOX00008330](#); [GLTFOX00008337](#); [NCR-FOX-0163035](#).)
639. Bergstrom increased its waste water sampling in 1975 and tested monthly. ([NCR-FOX-0140222](#); [NCR-FOX-0141386](#).)
640. In 1975, Bergstrom expected to see a decrease in PCB concentrations in its effluent because the potential sources of PCBs to the Bergstrom Mill from post-industrial, pre-consumer NCR Paper were expected to diminish to essentially zero. Bergstrom's expectation proved incorrect.
641. Bergstrom investigated the source of any continuing source of PCBs to the Bergstrom Mill, testing all major grades of incoming wastepaper to the mill in the middle 1970s. ([NCR-FOX-0140222](#); [NCR-FOX-0141386](#).)

642. Bergstrom officials learned that, in addition to old NCR Paper, all wastepaper could have low concentrations of PCBs if made from recycled fiber.
643. Samples of various grades of incoming wastepaper revealed low, but widespread, PCB concentrations in all major grades of wastepaper as well as virgin pulp. (NCR-FOX-0141386, at [387-392](#).)
644. Analysis of numerous samples indicated that virtually every major grade of wastepaper or raw fiber coming into the mill, including ledger grades, pulp substitutes, and virgin pulp contained low levels of PCBs. (NCR-FOX-0141386, at [387-392](#); NCR-FOX-0141386, at [387-392](#); GLTFOX00005234, at [253-255](#).)
645. Bergstrom concluded that the low-level contamination of the incoming wastepaper provided the only source of PCBs to the Bergstrom Mill's effluent. (NCR-FOX-0141386.)
646. By the end of 1975, Bergstrom concluded that wastepaper provided by one source, Shade Information Systems ("Shade"), yielded higher concentrations of PCBs than other grades of incoming wastepaper. (NCR-FOX-294457, at [458](#); NCR-FOX-0161442.)
647. Wand informed Shade that its desktop recycling program should be cleaned up to avoid accepting older PCB-containing NCR Paper into its wastepaper stream. (NCR-FOX-0161441.)
648. At the end of 1976, in response to the continuing PCB levels in incoming Shade wastepaper, Bergstrom stopped taking the desktop recycled materials from the Shade recycling program.
649. In 1977, Bergstrom's effluent PCB concentrations averaged 20 ppb, corresponding to less than one pound per day. (NCR-FOX-0116143.)
650. Analysis of Bergstrom's effluent from 1978 averaged 5.5 ppb. (NCR-FOX-0116143.)
651. PCB concentrations in influent and effluent at the Bergstrom Mill continued declining. In 1979, most samples yielded non-detect, with detectable effluent concentrations averaging 1.8 ppb. (NCR-FOX-0116143.) At these levels, Bergstrom discharged approximately 30 pounds of PCBs in 1979.

**2. Bergstrom's experience with testing incoming wastepaper revealed that small amounts of pre-1971 NCR Paper could be mixed in with some bales of "ledger" grade paper, and that virtually all major grades of wastepaper had small but measurable amounts of PCBs as a result of the decades of recycling mills' use of PCB-containing NCR Paper.**

652. Bergstrom discovered that all grades of wastepaper contained small amounts of PCBs due to the introduction of millions of pounds of PCBs into the wastepaper market entrained within NCR Paper.

653. Bergstrom also discovered that no effective method existed to screen for, or to remove, single sheets of the more highly-concentrated pre-1971 NCR Paper that might be part of a 1,500-2,000 pound bale of paper received by the Bergstrom Mill.
654. The Bergstrom Mill operating as a wastepaper recycling mill, from an economic standpoint, had only two options – either continue to recycle post-industrial grades of wastepaper or to shut down entirely.
655. Bergstrom took part in an open dialogue with regulators from the WDNR, the Office of Solid Waste, and the EPA regarding the recycling of wastepaper and effluent PCB limitations.
656. During the same period, some regulators requested that Bergstrom recycle low-level PCB-containing materials from Shade, while other regulators discussed the potential establishment of a zero or 5 ppb limitation for the discharge of PCBs.
657. At the time the WDNR proposed these effluent limitations, Bergstrom could not have continued its recycling operation and met the proposed zero PCB discharge limitation.
658. Bergstrom understood that the limitations of the PCB testing technology, including an inability of the technology to provide results that were accurate to within a few parts per billion, would effectively turn a 5 ppb limit into a zero discharge limitation. (NCR-FOX-163341, at [345-346](#).)
659. The EPA discussed this issue with Bergstrom and looked more globally at wastepaper recycling. The EPA determined that the benefits of recycling wastepaper outweighed the minute discharges of PCBs associated with that recycling.
660. In August 1975, NCR's Tom Busch expressed concern over regulation of wastepaper recycling in anticipation of upcoming the WDNR hearings. ([GLTFOX00001918](#).)
661. Mr. Busch informed Bergstrom that NCR was concerned that as a recycler, the upcoming wastepaper regulations could be unbearable, and that the cost of measuring and regulating PCB discharges from recycling would be prohibitive. ([GLTFOX00001918](#).)

**3. Bergstrom's limited involvement with Government encouraged post-consumer wastepaper recycling in the mid-1970s was well intentioned and was not expected to involve receipt of pre-1971 NCR Paper.**

662. Bergstrom installed a program at its mill to recycle paper used by employees.
663. Partly at the behest of the EPA, Bergstrom took part in a desktop recycling program initiated by Shade.
664. Shade designed the program to be a closed loop system, whereby Bergstrom sold base paper to Shade, Shade converted the paper into forms, sold those forms to end users, and then set up desktop recycling bins for the end-users to recycle unwanted paper. When delivering more forms, Shade would pick up the bins and return the recycled paper to

Bergstrom. Bergstrom would use the fiber from that paper to create more base paper for Shade.

- 665. The State of Wisconsin and the EPA used the Shade desktop recycling program and the EPA employees encouraged Bergstrom to continue the program. (MENFOX00005599, at [630](#).)
- 666. The desktop recycling bins included a sign indicating that only current desktop paper was appropriate for recycling. Mr. Wand recalled that they were marked “no files.” (MENFOX0000559, at [630](#).)
- 667. Bergstrom’s continued testing of incoming wastepaper for PCBs indicated that some of the incoming Shade wastepaper included old files that contained some amount of pre-1971 NCR Paper. ([NCR-FOX-0161441](#).)
- 668. Bergstrom wanted to support the Shade program, and wrote to Shade indicating the problem and the need to fix it. ([NCR-FOX-0161442](#).)
- 669. Shade continued to bring in recycled paper that had higher than typical PCB concentrations, causing Bergstrom to stop accepting this stream of wastepaper in 1976.

#### **4. Bergstrom installed state of the art primary treatment in 1952.**

- 670. Prior to implementation of the Clean Water Act, the State of Wisconsin did not impose numerical limitations on discharge of solids from the Bergstrom Mill. However, the State had a long standing program of advising dischargers like Bergstrom to implement improvements in the quality of their waste water discharge. ([GLTFOX00005030](#).)
- 671. In 1952, in response to the State of Wisconsin’s program, Bergstrom installed primary waste water treatment at the Bergstrom Mill. Bergstrom installed a system known as the “Walker Tank” (Walker being the manufacturer) that removed solids from Bergstrom’s principal waste water streams. (NCR-FOX-0128204, at [206](#); [GLTFOX00005040](#), at [042-046](#).)
- 672. The Walker Tank was one of the first primary treatment systems installed by any paper mill in Wisconsin. (NCR-FOX-0128204, at [206](#); [GLTFOX00005040](#), at [042-046](#).)
- 673. Annual waste surveys, from the State of Wisconsin’s Committee on Water Pollution, established effluent goals. Those surveys demonstrate that the Walker Tank removed 50-70% of suspended solids 1952 to 1967, results consistent with industry at the time. (Ford Expert Report at [13-15](#); [GLTFOX00006065](#), at [077-144](#).)
- 674. Bergstrom hired a consultant to conduct an internal audit of its operations in 1962. (NCR-FOX-0220019, at [020](#).)
- 675. Bergstrom spent the next several years following measures suggested by the consultant to improve waste treatment efficiencies.

- 676. Bergstrom installed modern save-alls to increase treatment efficiency. (NCR-FOX-0128204, at [206](#).)
- 677. Research into and introduction of chemical treatment of waste water was done, including continuous addition of polyelectrolytes to aid flocculation-sedimentation. (NCR-FOX-0128204, at [206](#).)
- 678. Bergstrom implemented water recycling programs to decrease the rate of flow over the Walker Tank, which increased the settling of suspended solids. (NCR-FOX-0128204, at [210](#).)
- 679. Bergstrom installed its No. 5 paper machine in 1965, which doubled Bergstrom's production capacity. Bergstrom responded by increasing efficiency of water usage, keeping its overall flow to the waste treatment plant consistent with pre-1965 levels. (GLTFOX00006065, at [128-144](#).)
- 680. Consistent improvement of TSS removal efficiencies demonstrate that Bergstrom's continued efforts towards treating its waste water kept pace with the effect its increased production had on waste water treatment systems operation until a new system was installed in 1967. (GLTFOX00006065, at [077-144](#).)

#### **5. Bergstrom installed a primary clarifier in 1967.**

- 681. In 1965, Bergstrom started planning for a new and larger waste treatment system. (NCR-FOX-0128204, at [206](#).)
- 682. In 1966, Orville Ross prepared a memo which outlined plans for Bergstrom's future waste treatment needs. ([NCR-FOX-0145669](#).)
- 683. A new state-of-the-art waste treatment system was completed and on-line in 1967 at a cost of 1.2 million dollars. (NCR-FOX-0128204, at [206](#); [GLTFOX00005040](#).)
- 684. Suspended solid removal efficiencies rose to 80-85% in the 1967 to 1971 period. (GLTFOX00006065, at [128-144](#).)
- 685. In 1971, Bergstrom implemented a plan to upgrade its deinking capacity and to improve its efficiency in using and treating process waters returned to the Lower Fox River. ([NCR-FOX-00128244](#).)
- 686. Beginning in 1971, treatment efficiencies rose to above 90% TSS removal and continued at that level throughout the 1970s. (NCR-FOX-0057737, at [738](#); [NCR-FOX-0161423](#).)
- 687. In 1971, the upgrades to the primary clarifier allowed TSS treatment to become so efficient that the Bergstrom Mill began to put one million gallons per day of water from the primary clarifier back into mill operations rather than directly to the Lower Fox River. ([GLTFOX00008330](#); [GLTFOX00008337](#); GLTFOX00000951, at [955-956](#); [NCR-FOX-0159306](#).)

688. Bergstrom continued its efforts to improve its primary treatment system's efficiency over the next decade.
689. Bergstrom was involved with efforts by the Environmental Committee of the Wisconsin Paper Council to evaluate and promote use of the best practices for treatment of waste water by the paper industry.

**6. Bergstrom took reasonable and appropriate steps to meet 1976 effluent requirements.**

690. In 1972, Bergstrom negotiated a contract with the Cities of Neenah and Menasha regarding connection to a future secondary treatment system on which the cities planned to start construction in 1974. That facility did not exist in 1972. (NCR-FOX-0128204, at 207-209; [NCR-FOX-0091450](#); [NCR-FOX-0127445](#).)
691. The contract required the cities to provide an initial estimate of cost to Bergstrom, and allowed Bergstrom the opportunity to opt out of the contract if the final cost quoted exceeded a specified amount. ([NCR-FOX-0091450](#).)
692. In early 1974, several other industrial entities opted out of the process when the final quote was well in excess of the specified trigger amount.
693. In early 1974, Bergstrom officials had concerns regarding whether the cities would be able to complete a secondary waste treatment system in time to meet the State of Wisconsin's deadline.
694. Bergstrom, faced with a slow process that might not meet the July 1976 State deadlines and with a significantly higher cost than anticipated, exercised the contract's opt-out provision, and moved forward with installation of its own secondary treatment plant. ([NCR-FOX-0163341](#).)
695. Bergstrom evaluated the top secondary treatment systems available in 1974 and selected the Zurn Attischolz (ZA) system, believing it was the best secondary system for a deinking mill available in the world.
696. The installation of the ZA system was extremely expensive (the cost was more than Bergstrom's annual profit).
697. The ZA installation required Bergstrom to agree to a turn-key operation with Van Luven, the only consultant permitted by ZA to install its system in the United States.
698. Van Luven, had just completed installation of ZA system for Wisconsin Tissue Mills.
699. The high cost of the ZA system relative to the Bergstrom's annual profit required Bergstrom to finance installation costs.
700. Bergstrom could not in good faith sign a final agreement for installation until the financing was complete, causing a delay in the project of several months.

701. Removal of BOD was the primary focus of the 1976 requirements that paper mills install secondary treatment.
702. In 1976, PCB testing at the time demonstrated to Bergstrom that PCBs primarily attached to TSS, which were predominantly removed through the settling process of the primary clarifier. Bergstrom's efforts to minimize PCB discharges focused on continuing to achieve highly efficient TSS removal.
703. Bergstrom put forth considerable efforts over the next two years to get the ZA system up and running.
704. The ZA system was in operation by December 1976, only a few months after the initial deadline. (NCR-FOX-0125597, at 601 and NCR-FOX-0115623, at 626.)
705. Citing unintentional delays in obtaining equipment, the State of Wisconsin agreed that Bergstrom should pay only a \$600/month penalty for the July through December, 1976, period during which the ZA system was not yet operational. (NCR-FOX-0127938, at 939.)
706. On any day prior to June 1971 in which Bergstrom received a shipment of PCB-containing broke from ACPC, that broke would have contained approximately 1,500 pounds of PCBs, or approximately five to ten times more than the discharge for the entire year of 1976 from the Bergstrom Mill.
707. The ZA system experienced start up issues over the course of the next year, mainly due to complexities involved with operating a new technology requiring maintenance of the microbes used to eat the waste material. (NCR-FOX-0126506; NCR-FOX-0126688.)
708. The microbes used in the ZA system substantially increased the level of solids exiting the secondary treatment system, although these solids were significantly different from the potentially PCB-containing TSS from deinking and papermaking operations. (NCR-FOX-0126506; NCR-FOX-0126688.)
709. Bergstrom experienced several effluent limitation violations, largely related to BOD values. These violations did not affect discharges of PCBs to the Lower Fox River in any material respect. (NCR-FOX-0126506; NCR-FOX-0126688.)
710. Bergstrom continued investing significant time and effort into the ZA system, including installation of new filter presses and an anti-chlorination system. (NCR-FOX-0126688.)
711. Bergstrom's continued effort paid off. Bergstrom experienced no significant operational problems with the ZA system after April 1978. (NCR-FOX-0165084, at 095.)
712. From 1977 through the end of the relevant period, Bergstrom's waste treatment system substantially complied with the WDNR regulations and resulted in the release of negligible concentrations of PCBs into the Lower Fox River. (NCR-FOX-0165084, at 095.)

**7. Bergstrom developed the Arrowhead Park Landfill in accordance with a long-term plan developed in conjunction with the Army Corps of Engineers and the City of Neenah.**

- 713. Bergstrom developed the Arrowhead Park Landfill beginning in 1952 in conjunction with installation of its waste water treatment plant. (Shimek Expert Report at [3](#).)
- 714. The landfill site consisted of a wetland area at the south end of Little Lake Butte des Morts that the State of Wisconsin granted to the City of Neenah so that the City could lease it to Bergstrom for the purpose of filling in the area with sludge from Bergstrom's waste treatment plant. (Shimek Expert Report at [3](#).)
- 715. The plan identified in 1950, called for the long term creation of a bulkhead dike running from a point adjacent to the Walker Tank, running almost half a mile west to the Neenah Slough. (Shimek Expert Report at [3](#).)
- 716. Bergstrom built the dike in advance of the sludge filling, using a combination of clay and stone, throughout the 1950s and 1960s. (Shimek Expert Report at [3-4](#).)
- 717. Bergstrom completed the dike in 1970, totally enclosing the landfilled sludge. (Shimek Expert Report at [4](#).)

**8. Bergstrom operated the Arrowhead Park Landfill in a manner consistent with industry's approach to environmental controls during the relevant time.**

- 718. From the Fall of 1971 through closure of the Arrowhead Park Landfill in 1976, Bergstrom operated Arrowhead Park Landfill in a manner that minimized the release of sludge into Little Lake Butte des Morts. (Shimek Expert Report at [5-6](#).)
- 719. Bergstrom employees that worked at the landfill during this period, including Robert Swoboda, who worked in the waste water section as an operator, testified that they never saw any sludge leaching out of the landfill and entering the lake.
- 720. Bergstrom completed its effort to completely enclose Arrowhead Park Landfill with a dike before Bergstrom learned of the presence of PCBs in NCR Paper. ([CORPSFOIA0000243](#); [WDNRFOIA0008972](#).)
- 721. The City of Neenah's use of Arrowhead Park Landfill as a discharge point for overflow from its drainage sewers ended with completion of the dike in 1970, decreasing flows from the landfill into the lake.
- 722. In addition to the completed clay-based dike, the drainage culvert established near the Neenah Slough sat seven feet above the base of the landfill and above the lake's water level, causing liquid from rains or other events in the landfill to back up within the lower elevations of an old drainage swale. (Shimek Expert Report at [5](#).)

723. The water moving within the landfill picked up little sludge, and most of the sludge that did become entrained within the water ended up soaking back into the wetland area adjacent to the culvert. (Shimek Expert Report at [5](#).)
724. The mass of PCBs in the sludge that may have left Arrowhead Park Landfill via the culvert is extremely small, likely on the order of several pounds per year. (Shimek Expert Report at [6](#).)
725. The mass of PCBs lost from the landfill from late-1971 to 1976 represents only a small decrease to the waste water treatment efficiency Bergstrom achieved during this same period, and in orders of magnitude, less than the mass of PCBs discharged on any day that the Bergstrom Mill recycled a load of broke from ACPC. (Shimek Expert Report at [6](#).)

**9. The closure of Arrowhead Park Landfill involved a team effort consisting of individuals from the Corps, the WDNR, the University of Wisconsin, and the City of Neenah.**

726. In 1969, Wisconsin adopted new landfill regulations, WAC RD 51, that prohibited the establishment or operation of landfills within 1,000 feet of a waterbody, but also recognized the need to grant exemptions for pre-existing, non-conforming landfills like Arrowhead Park Landfill. ([WI Admin. Code RD 51, Solid Waste Disposal, April 1969](#).)
727. In 1974, after a thorough review of Arrowhead Park Landfill information provided by Bergstrom, the WDNR granted Bergstrom a license to continue operation of the landfill and an exemption from the water body setback requirements of Wisconsin Administrative Code NR-151. ([NEENAHFOIA0003976](#).)
728. The 1974 license included a plan for closing the landfill by September 1976. ([NEENAHFOIA0003976](#).)
729. At this time, the State of Wisconsin regulators had closed very few landfills, and many people became involved with researching the appropriate methods and regulations to govern closure of the Arrowhead Park Landfill. (Shimek Expert Report at [3-4](#).)
730. Throughout this period, Bergstrom coordinated with the Corps, the City of Neenah, the WDNR, and the University of Wisconsin in a series of research and planning sessions regarding the appropriate closure of Arrowhead Park Landfill. ([NEENAHFOIA0003884](#).) Closure activities included developing test plots for various grass covers, evaluation of drainage alternatives, and various depth of cover testing. ([GLTFOX00005271](#).)
731. Bergstrom stopped filling Arrowhead Park Landfill predominantly in 1975, with some filling occurring in 1976, as part of the closure plan's attempt to achieve proper grade. (Shimek Expert Report at [4](#).)

732. Control over most of Arrowhead Park Landfill reverted back to the City of Neenah in or about 1976, and responsibility for continued closure or redevelopment of the landfill rested with the City of Neenah from this time forward. (Shimek Expert Report at 4.)

**D. Fort Howard Mill (Georgia-Pacific)**

733. Fort Howard had an extensive scientific-based research and development program within the corporation throughout the 1970s, 1980s and 1990s, addressing many constituents, including PCB presence and removals. In particular, in the 1980s and 1990s, Fort Howard conducted sophisticated chemical experiments in tertiary and primary treatment to reduce further PCBs. (NCR-FOX-0100803.)
734. There was a continual upgrade and improvement of Fort Howard's waste water treatment system throughout the 1970s, 1980s, 1990s, and even today. (GPFOX00020343; NCR-FOX-0111537.)
735. Throughout the various in-plant upgrades and additions to the Fort Howard waste water treatment system, Fort Howard maintained contact with, and received approvals from, the WDNR. (GPFOX00020343; NCR-FOX-307911; NCR-FOX-0111537.)
736. Through these efforts, Fort Howard achieved significant reductions to levels of discharges that were already low when sampling began in 1975. (NCR-FOX-0102365.)
737. Fort Howard voluntarily installed a primary settling basin system when the mill began deinking in the 1940s. (GPFOX00016521, at 537; GPFOX00015238, at 240.)
738. By 1948, Fort Howard had developed a chemical precipitating process which, when used in conjunction with the lagoon treatment process, raised the efficiency of treatment of solids to over ninety-two percent (92%). (GPFOX00015238, at 240; GPFOX00020343, at 349, 359.)
739. In approximately 1957 and 1958, Fort Howard constructed new larger and deeper settling basins. (GPFOX00016521, at 537.)
740. Removal of TSS in primary treatment had the effect of removing substantial PCB loads, even though Fort Howard was unaware of PCBs in its effluent at the time the primary settling lagoons were installed or during decades of operation. (GPFOX00020257, at 300.)
741. In 1957, Fort Howard began preliminary study work on secondary treatment of effluent. (GPFOX00016521, at 537.) Fort Howard experimented with a number of alternatives, including trickling filters, aerated stabilization basins, and activated sludge, but none of these experiments were successful. (GPFOX00016521, at 537-538; GPFOX00020343, at 349; GPFOX00108554; NCR-FOX-0000078.)
742. In 1966, Fort Howard began construction of a pilot plant to further experiment with activated sludge treatment. (GPFOX00016521, at 538.)

743. In June of 1970, Fort Howard submitted an application to the WDNR for approval of designs for a new activated sludge effluent treatment system. (GPFOX00020343.)
744. Fort Howard's application for approval of their effluent treatment plant design was approved by the WDNR on September 16, 1970. (GPFOX00020343; NCR-FOX-307911.)
745. Fort Howard's activated sludge treatment system was operational by the end of 1972. (NCR-FOX-0000304.) This system included two aeration basins. (GPFOX00020343, at 354.)
746. The activated sludge system accomplishes BOD removal and TSS control, and can attract PCBs associated with primary solids carryover into the secondary aeration systems. (GPFOX00020343; NCR-FOX-0111537, at 542.)
747. 1972 was an early date within the pulp and paper industry to add secondary treatment. (Ford Expert Report at 18.)
748. In the early 1970s, Fort Howard added to its analytical laboratory in order to develop in-house expertise in the analysis of PCBs in effluent. (NCR-FOX-0102469, at 470.)
749. In the mid-1970s and afterwards, Fort Howard cooperated with the WDNR in its identification and resolution of effluent quality control, including not only PCB removal through extensive sampling and data analysis, but also removal of BOD, TSS and nutrients such as nitrogen and phosphorus. (NCR-FOX-0107825.)
750. In 1975, Fort Howard retained Wisconsin Alumni Research Foundation ("WARF") to analyze effluent samples for the presence of PCBs. (Georgia-Pacific's Responses to NCR's First Set of Interrogatories, No. 4.)
751. In 1975, Fort Howard also began testing its own waste streams, process chemicals, and wastepaper for the presence of PCBs. (Georgia-Pacific's Responses to NCR's First Set of Interrogatories, No. 4.)
752. In 1976, Fort Howard constructed aeration basin #3, increasing the aeration capacity of the activated sludge system by fifty percent (50%). (Georgia-Pacific Responses to NCR's First Set of Interrogatories, No. 4; NCR-FOX-0102547, at 549.)
753. Throughout the 1970s, Fort Howard continued to work to reduce its discharge of TSS. (GPFOX00017603.)
754. In 1981 and 1982, Fort Howard piloted bioaugmentation of the secondary system employing mutant bacteria to reduce PCBs in effluent. This experiment was unsuccessful. (NCR-FOX-0102469, at 476.)
755. In 1981, Fort Howard significantly increased the aeration capacity of its waste water treatment system by constructing two covered aeration basins. (GPFOX0001531, at 532; NCR-FOX-0145116, at 118.)

756. In 1982, Fort Howard added primary clarifiers #3 and #4 for the primary treatment of deinking waste. (NCR-FOX-098695, at [697](#).)
757. From 1983 to 1985, Fort Howard again attempted to reduce PCBs in effluent by using bioaugmentation of the secondary system. This experiment was not successful. (NCR-FOX-0102469, at [476](#).)
758. In 1984, Fort Howard began investigating chemically assisted clarification (*i.e.* tertiary treatment) in order to reduce TSS and PCB discharges through the addition of alum and/or polymers to the waste water treatment process. (NCR-FOX-0110605.)
759. In 1985, Fort Howard investigated several PCB-related questions and submitted several reports to the WDNR related to these questions. (NCR-FOX-0102469, at [472](#).)
760. In 1985, Fort Howard began its sludge pressing operation and discontinued the use of primary settling ponds. (Georgia-Pacific's Responses to NCR's First Set of Interrogatories, [No. 4](#).)
761. In 1985, Fort Howard also began recycling mill sewer discharge. (Georgia-Pacific's Responses to NCR's First Set of Interrogatories, [No. 4](#).)
762. In May of 1986, Fort Howard formally began a tertiary treatment research project aimed at reducing PCB discharges. Fort Howard continued experiments with tertiary treatment throughout 1987, using a variety of treatment methods. (NCR-FOX-0102469, at [475](#).) However, the results were inconclusive. (NCR-FOX-0100429, at [429-430](#).)
763. In 1987, Fort Howard again investigated filtration methods, employing a proprietary sand filter. This device failed to produce significant PCB reductions. (NCR-FOX-0102469, at [475](#).)
764. In 1988, aeration basin #2 was upgraded from surface aerators to fine bubble diffusers and each phase of the conceptual engineering, design, and construction of the activated sludge plant was approved by the WDNR. ([GPFOX00105724](#).)
765. In 1988, Fort Howard began a trial on Chemically Assisted Primary Clarification ("CAPC") for the reduction of PCB, TSS, and turbidity removal from primary clarifier effluent. ([GPFOX00084380](#).)
766. In 1989, Fort Howard submitted a study plan to the WDNR describing Fort Howard's investigation into techniques to reduce PCB discharge. (NCR-FOX-0102468; NCR-FOX-102469.)
767. After submitting the study plan, Fort Howard continued to work closely with the WDNR on reductions of PCB discharge, and submitted regular updates to the WDNR on its progress. (NCR-FOX-0001967, at [2007](#); [NCR-FOX-0002040](#); [NCR-FOX-0102426](#); [NCR-FOX-0102445](#); [NCR-FOX-0102365](#).)

768. After 1990, PCBs were detected in Fort Howard's discharge only on rare occasions. (NCR-FOX-0102365, at [387](#).)
769. Fort Howard has never exceeded the PCB discharge limits provided in the WPDES permit that has been issued to Fort Howard since 1989. (Georgia-Pacific's Responses to NCR's First Set of Interrogatories, [No. 4](#).)
770. Throughout the relevant time period, Fort Howard continually reduced water flow from the mill through recycling, coagulant enhancement, and other approaches in reuse. (GPFOX00007602, at [605-606](#).)
771. Fort Howard began operating its landfill in 1964. (Schneider Dep., [84:23-24](#).) At that time, there was no regulatory requirement to permit the landfill or submit plans to regulatory authorities. (Pagel Dep., [55:5-6](#).)
772. The landfill was located north of the regional airport, six or more miles from the Lower Fox River. (Dawson Expert Report at [4](#).)
773. When Wisconsin regulations began requiring licensing of landfills, Fort Howard applied for a license for the landfill. (Pagel Dep., [55:10-11](#).) The license was granted effective October 1, 1974. ([GPFOX00025275](#).)
774. In 1982, Fort Howard began pumping leachate from the landfill to the Green Bay POTW. This was done with the full approval of the WDNR, disclosure of the potential PCB content of the sludge to the Green Bay POTW and the acceptance by the Green Bay POTW. ([GPFOX0118805](#); [GPFOX00111982](#); [GPFOX00123143](#).)
775. No measurable PCBs were transported to the Lower Fox River from Fort Howard's landfill. (Dawson Expert Report at [4](#).)
776. In 1991, Fort Howard was honored by the US EPA for its recycling and environmental efforts. It received the first annual Administrator's Award for innovative recycling advocacy. ([GPFOX00105179](#).)

#### **E. The John Strange Mill**

777. The John Strange Mill ("JSPM") did not conduct converting, deinking or bleaching processes, nor did it use virgin pulp in the manufacture of its products. (APIFOX0000245, at [271](#); MENFOX00002926, at [926](#).)
778. Beginning as early as the 1940s and 1950s, the JSPM monitored and enhanced its paperboard manufacturing processes to: increase efficiencies in production, achieve optimal recycling levels through optimal water use and minimize fiber loss through effluent waste water management. (Ford Expert Report at [19](#).)
779. Beginning in 1937, the NM POTW was equipped with primary treatment technologies to eliminate solids from the plant's effluent and managed the resulting sludge through incineration. ([NMSC\\_FOX\\_003953](#).) As of 1946, and perhaps even earlier, JSPM was

connected to the NM POTW. (NM\_FOX\_003953; *see also* Sugden Dep., 64:3-15.) In 1946, the NMSC reported that JSPM was discharging a volume of 3.35 mgd to the NM POTW. (NM\_FOX\_003953, at 956.) In 1950, the NMSC issued a survey indicating that JSPM was discharging to the NM POTW an estimated 324,000 gpd of waste water. By 1967, at the latest, NMSC used both a primary and high rate secondary treatment system (using activated sludge). (GLTFOX00000243.)

780. JSPM personnel kept in close contact with the NMSC and apprised the NMSC of its design capacity needs. (MENFOX00003062.)
781. In or about 1945, JSPM installed save-all fiber recovery units manufactured by Dorr-Oliver to separate and recover paper fiber from its process waste water before entering the Lower Fox River or the NM POTW. (Sugden Dep., 64:3-15.) Fibers recovered from the waste water stream were then directed back into JSPM's papermaking process. (Sugden Dep., 64:3-15.) The use of save-alls continued throughout the relevant period. (GLTFOX00002475, at 478; GLTFOX00004549, at 551; MENFOX00001254; MENFOX00001502; MENFOX00002906; MENFOX00002933; MENFOX00002992.)
782. For reasons unrelated to PCBs, beginning in the 1950s, JSPM and Menasha had in place company-wide policies and instructed employees to avoid, to the extent possible, all NCR Paper as furnish or feedstock for all manufacturing operations at JSPM. These are the types of policies that appear to have been discussed in BRDA's letter dated September 15, 1971, which states: "Normal operating practices of avoiding paper stocks containing NCR papers because of other problems has kept most of it out of our paperboard." (MENFOX00001640, at 641.) The attached enclosure further explained that "[t]hese materials are avoided in our mills because they develop dark colors when the web goes through the dryer section." (MENFOX00001640, at 642.)
783. JSPM did not purchase NCR carbonless copy paper "broke" or trim as furnish or feedstock in the operations at JSPM. The most abundant source of furnish or feedstock used at JSPM consisted of "old corrugated," which was the preferred raw material for the manufacturing of paperboard because it was less expensive than other types of furnish and JSPM made paperboard for use in low grade cardboard products. (Morris Dep., 41:17-19.) As stated in an attachment to BRDA's letter dated September 15, 1971, "Corrugated waste which has jute test liners or corrugating medium made from waste papers could have office waste containing NCR papers. The amount of corrugated (sic) made with jute test liners is extremely small, so this should not present a significant problem." (MENFOX00001640, at 642.)
784. Mixed office paper was purchased for JSPM from paper brokers for use as furnish or feedstock. However, due to the short fibers generally found in mixed office paper, as well as the presence of dyes, inks, and other contaminants, it was not the preferred raw material for the manufacture of the majority of JSPM's paperboard products. Records show the mill took in 100 tons per day mixed paper. When accepting bales of wastepaper furnish, JSPM and Menasha had the policies in place that required employees to not take bales of NCR Paper.

785. JSPM's practices for recycling paper complied with the industry standards.
786. By the late 1960s, effluent waters at JSPM were segregated as follows: (a) Water from the process went to NMSC, (b) Felt washing water and cooling water went to the river. ([MENFOX00003054](#); *see also* GLTFOX00002475, at 478 ("concentrated waste waters are discharged to a municipal sewer and the weaker ones are released to the Fox River").) There was no way to divert from one to the other. ([MENFOX00003054](#).)
787. In approximately the Spring of 1967, JSPM responded to a survey conducted by the Water Resources Bureau of the Department of Resource Development reporting on its status of solids liquid separation processes. This response indicates that JSPM had implemented both gravity filtration and water reuse programs at the mill. ([MENFOX00001437](#), at 440.)
788. From 1966 to 1967, solids losses at the JSPM were reduced from 3,140 lbs per day to 1,940 lbs per day. ([MENFOX00001180](#), at 180.) Through the use of save-alls, effluent flow was significantly reduced by water recycling from JSPM's white water collection and recycle program. As such, the separation of solids from the water phase resulted in a significant reduction of fibers, clays, and other constituents which constituted "primary solids" in a waste water treatment process common in the paper industry. (Ford Expert Report at 20.)
789. In 1968, JSPM installed Aqua Purge Showers for the re-use of white water; modified its #2 White Water Collection tank, which reduced the load to the NM POTW; installed #1 Machine Top Felt Showers to reduce the total amount of water used; and, installed Milton Roy Chemical Pumps to reduce the presence of fines in white water. ([MENFOX00001433](#).) That same year, JSPM personnel met with members of the Wisconsin Pulp and Paper Industry to discuss issues related to water pollution. The outcome of that meeting was that JSPM began focusing its efforts towards the elimination of all waste water outfalls to the Lower Fox River. ([MENFOX00001180](#).)
790. By June of 1968, JSPM was reporting that its "strong waters are discharged to the [NM POTW]" and that the mill had "placed an order for a pressure filtration screen which we expect to try in several locations in the expectation of cleaning up some of our waters for re-use on the paper machines." ([MENFOX00001253](#).)
791. By September 18, 1968, JSPM was operating a White Water Collection tank to reduce its loading to the NM POTW. ([MENFOX00001254](#).)
792. Beginning in 1971, JSPM began a program, which led to the combination and elimination of its outfalls to the Lower Fox River. ([MENFOX00002974](#).)
793. In the Fall of 1971, Menasha, which owned the JSPM at the time, first learned that NCR Paper was the source of PCBs in all paperstock.
794. Menasha joined paper industry efforts to address NCR's PCBs in recycled paper resulting from NCR's use of Aroclor 1242 in NCR Paper. (*See, e.g.*, [MENFOX00000166](#);

[MENFOX00000226](#); [MENFOX00001869](#); [MENFOX00001796](#); [MENFOX00001705](#); [MENFOX00000343](#); [MENFOX00002389](#); [NCR-FOX-0161368](#).)

795. Menasha sampled the paperboard it manufactured for PCBs in order to ensure that the PCB content in its food grade paperboard product did not exceed proposed and final FDA regulatory limits, which it never did. Allan Schenck, the then mill manager at JSPM, testified to the WDNR in 1975 that, industry-wide, peaks in the concentrations of PCBs in paperboard have “decreased dramatically since 1971, when PCB’s stopped entering the waste paper use and re-use cycle.” ([WEYERHAEUSERFOX-0000081](#); *see also*, [MENFOX00000200](#); [MENFOX00000786](#); [MENFOX00001949](#); [MENFOX00000156](#); [MENFOX00000162](#); [MENFOX00000218](#); [MENFOX00000230](#); [MENFOX00000231](#); [MENFOX00000232](#); [MENFOX00000233](#); [MENFOX00000235](#); [MENFOX00000236](#); [MENFOX00000074](#); [MENFOX00000234](#); [MENFOX00000237](#); [MENFOX00000239](#); [MENFOX00000242](#); [MENFOX00000243](#); [MENFOX00000301](#); [MENFOX00000340](#); [MENFOX00000342](#); [MENFOX00000357](#); [MENFOX00000353](#); [MENFOX00000348](#); [MENFOX00000351](#); [MENFOX00000356](#).)
796. Allan Schenck, the then mill manager at JSPM, testified to the WDNR in 1975 that, “Combination boxboard for food packaging [like the kind manufactured at JSPM] is made from recycled fibers selected to minimize PCBs.” With regards to PCB sampling of boxboard nationwide, Mr. Shenck testified that “PCB levels are decreasing rapidly.” ([WEYERHAEUSERFOX-0000081](#), at [083](#); *see also* [MENFOX00000178](#); [WTMFOX-00007878](#).)
797. Menasha also spearheaded efforts to look for new systems that might remove PCBs from NCR Paper that got into its mill by accident. ([WTMFOX00009833](#).)
798. In 1972, Allan Schenck called both Monsanto, the manufacturer of Aroclor 1242 (the PCB used by NCR in NCR Paper), and NCR’s own Appleton Paper Division to assess the risks associated with PCBs. ([MENFOX00000228](#).) Monsanto’s representative, W.B. Papageorge, and Mr. Schenck discussed when various end uses of PCBs stopped, including the use of PCBs in inks, paints, adhesives, plasticizers, lubricants, hydraulic fluid, heat transfer fluid, chlorinated terphenyls and NCR Paper. Mr. Papageorge told Mr. Schenck that: “Monsanto will be publishing the results of a two year animal feeding study in 60-90 days. This study was of the type designed for FDA food use approval. Mr. Papageorge said the results ‘are not alarming’ in Monsanto’s judgment. There are three Aroclors 1242, 1254 and 1260 depending on degree of chlorine substitution. Number 1242 used in NCR paper seemed a little less toxic in these studies.” (*Id.*) In Mr. Schenck’s call with NCR’s Appleton Papers, “An official of Appleton Coated stated ‘off the record’ that old PCB containing NCR paper could turn up in office waste for 3-5 years.” (*Id.*)
799. In mid-October of 1972, JSPM completed a major program of water conservation and in-plant recycling. Equipment was installed so that a portion of the water going to the NM POTW is rescreened and put back into the papermaking process. ([MENFOX00002926](#), at [927](#).)

800. By the end of 1972, JSPM had started recycling the wet felt washing water with the objective of reducing the volume of water and suspended solids going to the river. (MENFOX00003054, at 055.)
801. The JSPM looked into various treatment alternatives and ran experimental runs with certain technologies, including: D.S.M. Screens; Mechanical Filtration of all felt cleaning waters; Vacuum filtration; a Foxboro Mill Effluent System; a Bauer Hydrosieve; and, Calgon's Granular Carbon Treatment System for PCBs. (MENFOX00000878; MENFOX00001292, at 293-295; MENFOX00002906; MENFOX00002933; MENFOX00003034.)
802. By the end of 1974, JSPM had combined or eliminated all but a single outfall to the river; and, in mid-1976, JSPM was no longer discharging its sanitary or industrial process waters to the Lower Fox River. (MENFOX00001429, at 430; MENFOX00002900; MENFOX00002906; MENFOX00002923; MENFOX00002924; MENFOX00002925; MENFOX00002933; MENFOX00001272; MENFOX00002974, at 978; MENFOX00002985; MENFOX00003109; MENFOX00003119; MENFOX00003139; MENFOX0000405; NCR-FOX-0527400, at 417.)
803. From November 19 to 21, 1975, Jim Schedgick, Menasha's Technical Director, attended a conference in Chicago, Illinois, hosted by the EPA regarding PCBs. There, EPA discusses the sources of environmental PCBs and options the agency was considering for regulation of PCBs. (MENFOX00000395.)
804. In the middle of 1976, JSPM installed a clarifier with two large primary separation chambers and bar screens for additional pretreatment and recovery of primary solids prior to discharging to the NMSC. (NCR-FOX-0527400, at 417; MENFOX00002992.)
805. After 1976, no effluent from JSPM was being discharged directly into the Lower Fox River. (MENFOX00002893; NCR-FOX-0527400, at 417.)
806. PCB effluent sampling conducted at the Lower Fox River outfall at the JSPM between calendar years 1974 and 1976 show maximum PCB concentrations leaving the JSPM that were well below the PCB effluent standard of 10 parts per billion in effect in 1977. (MENFOX00003841.)
807. Effluent measurements taken from the JSPM outfall to the NMSC between 1978 and 1983, the year Menasha sold the JSPM to U.S. Paper, were non-detect for PCBs. (MENFOX00003841; MENFOX00002598; MENFOX00002994.)

#### **F. U.S. Paper Mill – The De Pere Mill**

808. During the Production Period, the U.S. Paper owned and operated one paper mill along the Lower Fox River in De Pere, Wisconsin (the "De Pere Mill"). The De Pere Mill produced primarily brown core stock. By the late 1960s, the De Pere Mill also manufactured a small amount of white board stock. Approximately 40 tons of brown and white core stock were produced daily at the De Pere Mill during the relevant time period. Food grade paper was not produced at the De Pere Mill.

809. Prior to 1950, U.S. Paper had installed and was operating a lagoon to treat waste water. Sometime prior to 1955, U.S. Paper added a second lagoon. (GLTFOX00001335, at 352.) The lagoons treated waste water by settling out solids before treated waste water was discharged over the ground and vegetation about 220 feet to the Lower Fox River.
810. Use of settling lagoons was an accepted and effective method of treating waste water at that time.
811. Lagoon sludge removal was a part of the U.S. Paper lagoon management program and U.S. Paper kept the WDNR informed of that fact. (USPFOX00000086.)
812. Sludge was removed by a crane and sludge bucket, and trucks with trailers took it off site; there is no evidence that any sludge from the U.S. Paper lagoons was disposed of in or near the river.
813. In March 1964, the Wisconsin Committee on Water Pollution recommended that U.S. Paper reduce its fiber loss to less than 1% of production. (NCR-FOX-0502662.)
814. Between 1963 and 1967, U.S. Paper lowered its percentage of fiber discharge, per ton of production, while significantly decreasing the volume of waste water discharged. (NCR-FOX-0502662, at 664; GLTFOX00001335, at 360-362; USPFOX00000146, at 148; USPFOX00000088, at 090.)
815. U.S. Paper reduced its fiber loss from 2.97% per ton of production in November of 1963, to 0.35% per ton of production by November of 1967. (NCR-FOX-0502662, at 664; GLTFOX00001335, at 360-362; USPFOX00000146, at 148; USPFOX00000088, at 090.)
816. U.S. Paper accomplished this reduction in fiber discharge by installing wedgewire screens at various points in their production process and efficiently operating their lagoon system. (NCR-FOX-0502662; GLTFOX00001335, at 360-362; USPFOX00000088; USPFOX00000146.)
817. By September 1965, U.S. Paper reduced both water usage and fiber loss by installing a 100 mesh sidehill screen. (GLTFOX00001322.)
818. By 1966, U.S. Paper further reduced both water usage and fiber loss by installing two sidehill washers. (USPFOX00000146.)
819. By 1967, US Paper added a save-all unit designed to capture additional fiber, which resulted in reduced fiber loss that allowed US Paper to reuse its water even more. (USPFOX00000088.)
820. By August 1969, U.S. Paper further reduced the volume of water discharged as effluent by installing a north save-all. (USPFOX00000086.)
821. The lagoons and the save-all type equipment used by U.S. Paper worked, because during the 1960s U.S. Paper's waste water discharge declined from 628,000 gallons per day in

- 1963 to 91,000 gallons per day in 1967, and U.S. Paper's fiber discharge as a percentage of production declined substantially below 1%. (NCR-FOX-0502662, at 664; GLTFOX00001335, at 360-362; USPFOX0000146, at 148; USPFOX00000088, at 090.)
822. In July 1970, U. S. Paper requested permission from the WDNR and the City of De Pere to discharge its waste water to the De Pere POTW, instead of to its lagoon system. (USPFOX00000081; USPFOX00000084; USPFOX00000085.)
823. The WDNR acknowledged U.S. Paper's request was in compliance with Order No. 4B-68-11a-42A 9. (USPFOX00000083.)
824. U.S. Paper's consultant, Robert E. Lee & Associates, submitted to the City of De Pere plans and specifications for U.S. Paper's municipal waste water connections and J.H. Lenz, De Pere City Engineer, approved those plans and specifications on July 30, 1970. (USPFOX00000196.)
825. On August 10, 1970, those plans and specifications were also submitted to the WDNR with a request for approval and the WDNR approved the plans and specifications as submitted. (USPFOX00000197; USPFOX00000076.)
826. By March of 1971, the De Pere Mill had installed additional equipment to recapture and reuse process wash water, including the installation of a settling tank. (NCR-FOX-0004730; NCR-FOX-0004735; NCR-FOX-0004736; USPFOX00000074.)
827. The sewer connection was successfully completed by March 1971 and, thereafter, there is no evidence U.S. Paper effluent was ever discharged directly to the Lower Fox River. (USPFOX00000074; USPFOX00000080.)
828. On June 23, 1971, U.S. Paper received a confirmation letter from the City Engineer stating, "It is apparent that the [U.S. Paper] effluent is not causing any problems at our treatment plant." (USPFOX00000075.)
829. U.S. Paper notified the WDNR of the sewer connection in July 1971 and the WDNR acknowledged U.S. Paper's progress report. (USPFOX00000073.) On May 22, 1972, the WDNR formally acknowledged full compliance with Order No. 4B-68-11a-42A and expressed its appreciation for the constructive actions taken by U.S. Paper. (GLTFOX00001366, at 369.)
830. The De Pere POTW has reported no problems processing U.S. Paper's effluent since its final connection in 1971. (NCR-FOX-0004735; NCR-FOX-0004740.)
831. In 1973, the WDNR, through NR 101, began requiring industry, including all paper recyclers, to test their effluent.
832. Beginning in 1973, U.S. Paper retained environmental engineering firms to conduct the tests required by NR 101. (USPFOX00000066; USPFOX00000198.)

833. None of the tests ever detected PCBs in U.S. Paper's effluent. ([USPFOX00000210](#); [USPFOX00000066](#), at [068](#); [USPFOX00000053](#); [USPFOX00000054](#); [USPFOX00000055](#); [USPFOX00000056](#); [USPFOX00000057](#); [USPFOX00000058](#).)
834. In 1968, U.S. Paper began filling some low land near the river to protect against a possible discharge after it later hooked up to the POTW and deactivated the settling lagoons. There were no regulations that clearly required a permit for such activities at the time. (API-GE028089, at [8089-090](#).)
835. Subsequently, U.S. Paper notified the WDNR that it would build a rubble mound bulkhead to protect the river and held off completing the fill and bulkhead work pending a response. ([USPFOX00000197](#).)
836. The WDNR issued a permit to complete the bulkhead, which would allow the U.S. Army Corps of Engineers (the "Corps") to begin its process to issue a permit for the project, so the Corps served U.S. Paper with a cease and desist order in April of 1974, to ensure that U.S. Paper did not complete the work before the Corps finished processing U.S. Paper's permit application. ([API-GE028089](#).)
837. The Corps recommended that U.S. Paper not be prosecuted for its prior fill project and the U.S. Attorney concurred and declined prosecution, allowing the Corps to commence its permitting process. ([API-GE028113](#).)
838. U.S. Paper timely completed its permit application and the Corps issued a permit for the U.S. Paper bulkhead and fill project. ([USPFOX00000013](#); [USPFOX00000013](#); [USPFOX00000015](#); [USPFOX00000016](#); [USPFOX00000017](#); [USPFOX00000018](#); [USPFOX00000019](#); [USPFOX00000020](#); [USPFOX00000021](#); [USPFOX00000022](#); [USPFOX00000023](#); [USPFOX00000025](#); [USPFOX00000026](#); [USPFOX00000027](#); [USPFOX00000028](#); [USPFOX00000029](#); [USPFOX00000031](#); [USPFOX00000032](#); [USPFOX00000033](#); [USPFOX00000036](#); [USPFOX00000040](#); [USPFOX00000041](#); [USPFOX00000042](#); [USPFOX00000044](#); [API-GE028080](#).)
839. There is no evidence U.S. Paper disposed of sludge from U.S. Paper's lagoon in the fill area.
840. During the relevant time period, U.S. Paper cooperated with government agencies, reduced its discharges significantly and otherwise acted reasonably and appropriately with respect to its waste water treatment and activities on the Fox River.

#### **G. The Neenah-Menasha Sewerage Commission**

841. The Wisconsin legislature required POTWs to accept waste except to "prohibit discharge into such sewers, of any liquid waste deemed detrimental to the sewerage system herein provided for." ([Wis. Stat. § 66.20\(11\)\(g\) \(1935\)](#).) In 1971, the legislature amended the statute language to include waste that "will or may be harmful to the system or any person operating it." ([Wis. Stat. § 66.24\(3\) \(1971\)](#).) To this day, NMSC has not experienced harm to its operators or its systems from PCBs. (Ford Expert Report at [28](#).)

842. Beginning in 1937, the NM POTW was equipped with primary clarifiers to remove solids (and thus PCBs) from the plant's effluent and managed the resulting sludge through incineration. By 1967, the NM POTW used both a primary and high rate secondary treatment system (using activated sludge) to remove solids (and thus PCBs). (NMSC-FOX-003953; GLTFOX00000243.)
843. On May 14, 1968, the WDNR ordered NMSC by October 1, 1968 to submit reports: (1) providing for the exclusion of clear water from the sanitary sewers; (2) for the construction of improvements to the treatment facilities in keeping with state water quality standards and the recommendations of the Lake Michigan Enforcement Conference, or; (3) instead of (1), for the construction of treatment facilities adequate to accomplish satisfactory treatment of all wastes and waters tributary to the sewer system. (GLTFOX00003743, at 778-779.)
844. In 1969, NMSC began a long, arduous process to expand the NM POTW. In April 1969, NMSC hired Consoer, Townsend and Associates to design the expanded plant, and in August 1970, NMSC filed applications for state and federal aid. (NMSC\_FOX\_000633, at 653.) In December 1971, NMSC received 5.5% of the estimated \$24 million project cost. (*Id.*) Further offers from the federal and state governments assured 80% funding of the total project cost. (*Id.*) NMSC received approval for phase A and phase B construction plans in August 1972 and January 1973, respectively. (NMSC\_FOX\_000715, at 736.) Construction bids for the major portion of the expansion project were opened in March 1973. (*Id.*) NMSC aggressively pursued the EPA to make its federal grant commitment known, but NMSC was forced to reject all bids when no response was received. (*Id.*) In September 1973, NMSC re-applied to the EPA for an increase in eligible project costs upon which their grant would be based. (*Id.*) The EPA approved a revised eligible project cost estimate in October 1973. In January 1974, after five years of work and \$1,000,000 in expenses, one of NMSC's largest industrial users announced its intentions to withdraw from the proposed plant expansion. (*Id.* at 737.) The remaining five largest industrial users followed suit. (*Id.*) In December 1974, the EPA and the WDNR declared the project not cost-effective and no longer eligible for grants. (*Id.*)
845. In January 1975, NMSC established a new project schedule for the construction of a re-designed plant that would meet waste water pollution abatement requirements. (NMSC\_FOX\_000769, at 787.) The re-design involved a greatly reduced plant size to compensate for the withdrawal of NMSC's largest industrial users. (*Id.*) NMSC filed a federal grant application in April 1975, which the EPA approved in September, allowing NMSC to proceed with its Facilities Plan. (NMSC\_FOX\_000995, at 014.) The Facilities Plan was completed and filed for WDNR and EPA review in December 1977. In May 1978, the WDNR approved the plan, and the EPA issued a conditional approval. (*Id.*) The EPA questioned whether NMSC possessed the financial, legal, managerial, and institutional resources necessary to qualify for a federal grant. (*Id.*) In response, NMSC dissolved and re-organized under Wis. Stat. § 66.30, effective February 1979. (*Id.*) NMSC then filed a Step 2 grant application, which the WDNR returned citing the questionable capabilities of the re-organized NMSC. (*Id.*) Throughout 1980 and 1981, NMSC attempted to respond to the issues raised by the WDNR but, by the end of 1981, it

was determined that NMSC had not been properly recreated under Wis. Stat. § 66.30 and was not eligible for federal or state grants. (NMSC\_FOX\_001123, at 145.)

- 846. Negotiations and revisions continued into 1982. (NMSC\_FOX\_001191, at 219.) An Ordinance-Contract was signed in September 1982 making NMSC a grant-eligible entity. (*Id.*) NMSC began the engineering firm selection process in February 1982, and in December 1982, the engineering firm selected began work on the Step 2 plans and specifications. (*Id.* at 220.) Construction began in 1985, and the re-designed plant was completed in 1987. (NMSC\_FOX\_006905, at 906.)
- 847. NMSC's 1979 WPDES permit required that the re-designed plant be completed in 1987, which NMSC satisfied. (NMSC\_FOX\_005294; NMSC\_FOX\_005295, at 296; NMSC\_FOX\_006905, at 906.)
- 848. In 1971, the WDNR filed a lawsuit against the Cities of Neenah and Menasha and NMSC. The WDNR sought an injunction to force NMSC to operate facilities to handle all sludge from its primary clarifiers. Ultimately, the WDNR and the Cities of Neenah and Menasha and NMSC settled their lawsuit; the Cities of Neenah and Menasha each paid one half of the \$46,500.00 forfeiture, and NMSC paid nothing. (NMSC\_FOX\_004471, at 473.)
- 849. Bypassing of raw sewage at the NM POTW ceased by July 1971, except in instances of heavy rain. (NMSC\_FOX\_000130, at 135; NMSC\_FOX\_000769, at 793.)
- 850. Between 1974 and 1976, NMSC increased the size of its interceptor sewers from a range of 10" to 36" to 60". (NMSC\_FOX\_000834, at 857.)
- 851. NMSC's upgrades were performed by experienced engineering firms, including Consoer, Townsend and McMahon Engineers. (Ford Expert Report at 30; NMSC\_FOX\_000667, at 693; NMSC\_FOX\_001266, at 292.)
- 852. NMSC operated and maintained its POTW in a reasonable manner appropriate for the times.

#### **H. The Riverside Paper Mill (CBC Coating)**

- 853. Riverside Paper used both secondary fiber, some of which went through a limited deinking process, and "furnish prep," which consisted of virgin pulp and other paper making additives, to make its papers. (Holzknecht Dep., 57:3-20; Farnum Dep., 21:15-23, 23:23-24:3.)
- 854. Riverside Paper did not purchase NCR carbonless copy paper "broke" or trim as furnish or feedstock to use in its operations prior to 1971 and perhaps not until 1972. Sometime in 1971 or 1972, Riverside developed a process for limited deinking of NCR Paper and began to use small quantities of NCR Paper as secondary fiber in its operations; however, by Spring 1971 NCR Paper was no longer made with PCBs. (CBCFOX00002111; CBCFOX00002113; Burzynski Dep., 38:4-25, 61:2-17, 65:20-66:5.)

855. Riverside Paper also did not use the types of secondary fiber likely to contain pre-1971 NCR Paper. Riverside did not purchase file stock or mixed office waste. (Holzknecht Dep., 109:3-9, 109:17-20; Aber Dep., 28:12-14; Golper Dep., 61:20-25.) The nature of Riverside's product lines required the use of higher end furnish.
856. Riverside inspected shipments of incoming secondary fiber to confirm that it was receiving what it had purchased or that it could otherwise use the shipment, and to ensure that the shipment was not contaminated by "pernicious contraries." (Holzknecht Dep., 135:6-137:7.)
857. It is unclear whether Riverside Paper recognized at any time that all sources of secondary fiber could contain some level of PCBs. Regardless, the only alternative to eliminate this potential source of PCBs would have been for Riverside to stop recycling entirely.
858. Since at least 1957, Riverside utilized a recirculation and save-all system for treatment of wastes before discharge to the Lower Fox River. (NCR-FOX-0115473, at 510.)
859. In 1957, Riverside was ordered to conduct a study and develop plans for improvement to the recirculation and save-all system. (NCR-FOX-0115473, at 510.) Riverside complied with this order.
860. Since at least 1964, Riverside sent some of its industrial waste water to the Appleton POTW. (GLTFOX00002475, at 479.)
861. Prior to 1968, Riverside Paper employed drum save-alls and Dorr-Oliver washers. (Holzknecht Dep., 78:2-8.)
862. The save-alls Riverside used on its two paper machines recovered fiber out of the waste water stream so that it could be reused and reduced any TSS going to the Fox River. (Farnum Dep., 35:6-21, 78:5-16.)
863. Throughout the 1960s and early 1970s, Riverside sought to send additional waste water to the Appleton POTW, but technical factors precluded a hookup of more waste water until 1972. (COA-FOX-00018206; COA-FOX-00018210; COA-FOX-00018221; COA-FOX-00018202; COA-FOX-00020476.)
864. In May 1968, the WDNR ordered Riverside Paper to submit a report and schedule for the installation of improved treatment facilities. Riverside Paper complied with the deadline in the Order. (CBCFOX00005890; CBCFOX00001028, at 034.)
865. In 1968, Riverside Paper installed a new disk save-all on paper machine #2, with a measured efficiency greater than 99 percent fiber retention. (CBCFOX00004338; CBC's Answer to API's Interrogatories, No. 3.)
866. In 1970, Riverside Paper installed a new disk save-all on paper machine #1, with a measured efficiency greater than 99 percent fiber retention. The disk save-alls on both paper machines achieved a reduction of TSS to below 50 ppm. (CBCFOX00004336; CBC's Answer to API's Interrogatories, No. 3.)

867. In late 1972, in timely compliance with WDNR's December 16, 1969 order, Riverside Paper connected most of its industrial waste water, including its most concentrated process effluents, to the Appleton POTW system. Consistent with the WDNR order, effluent from Riverside's in-plant save-alls continued to be discharged to the Fox River. (CBCFOX00005777, at [781](#); [NCR-FOX-0004352](#).)
868. Following hook-up to the Appleton POTW, Riverside discharged its waste water from the deinking process, bleach plant, some filter plant waste water and its other strong process waste waters to the Appleton POTW. By late 1974, all of the filter plant waste water, including filter plant backwash, also went to the Appleton POTW. (CBCFOX00005570, at [572](#); NCR-FOX-0004459, at [461](#).)
869. Riverside Paper's WDNR waste water discharge permits allowed for the continued discharge to the Lower Fox River of outfall 001 (boiler blow down, cooling water and drain water) and outfall 002 (clear whitewater from save-alls). (NCR-FOX-0055600 at [606](#); CBCFOX00005570, at [572](#).)
870. From the time of its first discharge permit in December 1974 and continuing through 1979, the date of Riverside's last PCB detect, Riverside complied with the total suspended solid limitations of its permits with rare and short term exceptions. (CBCFOX00005570, at [573](#); CBCFOX00007342, at [343-344](#); NCR-FOX-0055600, at [613](#); CBCFOX00007329, at [331](#); [NCR-FOX-0055998](#).)
871. In 1974, Riverside began testing its effluent for PCBs as required by the DNR. (Holzknecht Dep., at [156:9-23](#).)
872. Riverside's PCB effluent testing conducted at outfalls 001 and 002 to the Lower Fox River from 1974 to 1988 showed no detection of Aroclor 1242 ever going to the River, other than a December 1980 detect which was and is understood to have been an analytical or typographical error. ([CBCFOX00003598](#); APIFOX00000001, at [011-012](#); CBCFOX00001333, at [343](#).)
873. A table of data from the State Lab of Hygiene indicates a single detect of Aroclor 1248 in the amount of 3.6 ppb going from Riverside to the River in February 1976, but Riverside is unaware of any laboratory test reports indicating such a detect. (The same table lists a detect of Aroclor 1221 and 1232 in October 1988, but the underlying lab report confirms that the test results actually were non-detects.) (APIFOX00000001, at [011-012](#); CBCFOX00003579, at [580-581](#).)
874. Riverside's PCB effluent testing conducted at outfalls 003 and 004 to the City of Appleton POTW from 1974 to 1988 showed only two detects of Aroclor 1242, one in December 1974 and one in December 1979. A table of data from the State Lab of Hygiene indicates an additional detect going to the POTW in 1974, but again Riverside is unaware of any laboratory test reports indicating such a detect. All three detects were 3.0 ppb or less. ([CBCFOX00003598](#); APIFOX00000001, at [011-012](#).)

875. Riverside did not have any PCB discharge limits in any of its WPDES permits and only one of its permits required Riverside to monitor for PCBs. (NCR-FOX-0055600, at [600-606](#), [608-612](#), [650-651](#); [NCR-FOX-0055652](#); NCR-FOX-0055654, at [654-659](#), [662-677](#).)
876. In June 1982, the WDNR decided not to include monitoring or limitations for PCBs in Riverside's permit, stating: "This decision is based on the results of your EPA Form 2C application, the discharge monitoring report form data of the past three years, and the fact that all of the strong process wastewater resulting from the deinking operation is directed to the Appleton sanitary sewer system." (NCR-FOX-0055654, at [660-661](#).)

**I. WTM I Company (f/k/a Wisconsin Tissue Mills Inc.)**

877. From 1937 to September 1973, Wisconsin Tissue sent its waste water to the NM POTW for treatment prior to discharge to the Lower Fox River. The NM POTW treated the waste water it received from Wisconsin Tissue, along with other industrial and residential users, with primary treatment until 1965, when it added secondary treatment using activated sludge. (Ford Expert Report at [26](#).)
878. Since at least 1950, Wisconsin Tissue has used fiber recovery systems including sidehill screens and save-alls at its facility. ([NCR-FOX-0281789](#); APIFOX00054855, at [863](#); NCR-FOX-0281797, at [797](#).)
879. In May 1970, Wisconsin Tissue installed a 30,000 gallon tank to store and re-use hot water in order to reduce the mill's water consumption. This reduced the overall quantity of water discharged to the NM POTW. (WTMFOX00010554, at [554](#).)
880. Beginning in Fall 1970, Wisconsin Tissue began planning for additional improvements to reduce its water usage and waste water flows from its papermaking operations. ([NCR-FOX-0281916](#).) Subsequently, a new save-all system was added to Paper Machine #1 and major changes were made to the save-all system for Paper Machine #2. After these installations were put in operation on June 30, 1971, the effluent flow to the NM POTW was reduced from 2.5 mgd to 1.5 mgd. (WTMFOX00010690, at [690](#), [693](#); NCR-FOX-0280861, at [864-865](#).)
881. In April 1971, the Wisconsin Tissue Board of Directors approved construction of a primary waste water treatment plant and notified the NMSC and the WDNR. (WTMFOX00006751, at [752](#).) In December 1972, the Board approved construction of a secondary waste water treatment system. ([WTMFOX00006779](#).)
882. In November 1971, Roy F. Weston & Associates conducted a pilot plant study to recommend pretreatment methods. ([WTMFOX00010690](#); NCR-FOX-0281970, at [972](#); NCR-FOX-0280861, at [865](#).)
883. In February 1972, Wisconsin Tissue hired S.J. Baisch Associates, Inc. to design the pretreatment facilities, and major pieces of equipment were ordered in June 1972, with delivery scheduled in February 1973. (NCR-FOX-0280861, at [865-866](#).)

884. Construction of the waste water treatment facility was completed in September 1973, and from September 1973 until May 1976, Wisconsin Tissue treated its waste water with primary and secondary treatment before sending it to the NM POTW for additional treatment and discharge to the Lower Fox River. The Wisconsin Tissue treatment system consisted of a primary clarifier, which removed suspended solids through a combination of physical and chemical means, and secondary treatment consisting of a Zurn-Attisholz two-stage activated sludge system that removed additional BOD and TSS by means of biological treatment. (WTMFOX00006301, at [310-311](#); WTMFOX00010740, at [740, 743](#); WTMFOX00007650; NMSC\_FOX\_003985; Ford Expert Report at [27-28](#).)
885. In January 1974, Wisconsin Tissue met with representatives from the WDNR to explore requirements for Wisconsin Tissue to discharge directly to the Lower Fox River. (WTMFOX00003764.) Because the Wisconsin Tissue waste water treatment plant was performing admirably, meeting 1977 “most practical” and 1983 “best available” treatment requirements of the WDNR and the EPA, there seemed to be no reason to continue sending the treated waste water to the NM POTW. (WTMFOX00007804, at [804](#).)
886. In September 1974, Wisconsin Tissue submitted an application for a WPDES permit to allow it to discharge directly to the Fox River. (WTMFOX00007804.)
887. The WPDES permit was issued in May 1975 and on May 12, 1976, Wisconsin Tissue began direct discharge to the Lower Fox River. (WTMFOX00007650; NMSC\_FOX\_003985.)
888. The Wisconsin Tissue waste water treatment plant was extremely effective in removing suspended solids (and thus PCBs). (NCR-FOX-0282164, at [169](#); WTMFOX00010864, at [865](#); WTMFOX00007675, at [680](#).)
889. In August 1975, Wisconsin Tissue representatives attended a Wisconsin Paper Council meeting and a WDNR hearing on PCBs during which it was learned that Aroclor 1242 was used in NCR Paper, and that office waste could be the source. (WTMFOX00008680; WTMFOX00007878.)
890. On September 16, 1975, Wisconsin Tissue contacted all of its wastepaper suppliers and ordered them to immediately discontinue sending Wisconsin Tissue any wastepaper containing office waste which it understood could contain NCR Paper made prior to 1971. (WTMFOX00009037.)
891. Wisconsin Tissue undertook a number of other measures after learning that NCR Paper contained PCBs, including:
- (a) In early 1976 Wisconsin Tissue conducted PCB trials of four different grades of recycled fiber including envelope, white ledger, colored ledger and colored manifold. The tests demonstrated that Wisconsin Tissue’s waste water treatment plant was effectively removing PCBs from its waste water

discharges. ([WTMFOX00009861](#); [WTMFOX00009866](#), at [867-869](#); [WTMFOX00009882](#).)

- (b) Wisconsin Tissue investigated alternative technologies for removing PCBs but ultimately did not find it necessary to take further action, as its treatment plant was already achieving PCB removal to levels well below the limits the WDNR ultimately required in waste water discharge permits. ([WTMFOX00009847](#), at [848](#).)
  - On January 22, 1976, George Mueller attended a meeting on carbon adsorption technologies. ([WTMFOX00008172](#).) He later corresponded with Calgon on the same issue. ([WTMFOX00008434](#).)
  - Wisconsin Tissue investigated the research of Dr. Dickson Liu, a Canadian researcher who was attempting to perfect PCB removal via organic/bacterial treatment. ([WTMFOX00008393](#); [WTMFOX00008397](#).)
- (c) Wisconsin Tissue's President and Vice President, Jim Asmuth and George Mueller, respectively, educated Wisconsin Tissue senior staff regarding the issue. ([WTMFOX00009304](#).)
- (d) Wisconsin Tissue management communicated with its employees about the issue via meetings with the Union. ([WTMFOX00007993](#); [WTMFOX00008208](#).)
- (e) Wisconsin Tissue representatives attended regional and national conferences to learn more about the PCB issue. ([WTMFOX00007878](#); [WTMFOX00009158](#), at [158](#).)
- (f) High-level Wisconsin Tissue management attended meetings such as those held by the Wisconsin Paper Council and American Paper Institute relating to PCBs. ([WTMFOX00009158](#); [GPFOX00102459](#); [GPFOX00015840](#); [WTMFOX00008181](#); [WTMFOX00008297](#); [WTMFOX00007675](#), at [675](#); [WTMFOX00004818](#).)
- (g) Wisconsin Tissue cooperated with government agencies regarding PCB studies. ([WTMFOX00008254](#); [WTMFOX00008219](#).)

892. In Spring 1974, and periodically thereafter, Wisconsin Tissue received recognition and accolades from various sources for the effectiveness of its waste water treatment process. ([NCR-FOX-0281275](#); [NCR-FOX-0224120](#); [WTMFOX00007254](#); [NCR-FOX-0551078](#); [NCR-FOX-0467476](#), at [480](#); [NCR-FOX-0003655](#); [WTMFOX00010864](#); [WTMFOX00010866](#); [NCR-FOX-0282488](#).)

893. The Wisconsin Tissue waste water treatment plant was very effective in removing PCBs, with a PCB removal rate of 96-99%. ([WTMFOX00007675](#), at [680](#); [NCR-FOX-0283355](#); [NCR-FOX-0283356](#), at [357](#).)

894. Wisconsin Tissue's effluent samples routinely reflected PCBs at either non-detect, or at very low levels. From 1973 (when NR 101 first required PCBs to be tested) through 1975, Wisconsin Tissue's effluent was at "non-detect" for PCBs with the one exception

in February 1975. In 1976 sampling reflected PCBs at an average of 1.3 ppb. After 1976 and into the 1980s, its effluent analyses consistently reported PCBs at non-detect with the exception of two samples (out of seven) in 1977 where the levels were just slightly above detection limits. (Ford Expert Report at 27-28; [WTMFOX00010892](#); [GPFOX00005545](#); [GPFOX00011838](#), at 842; [GPFOX00018978](#), at 981; [WTMFOX00007631](#); [WTMFOX00009158](#), at 159; [WTMFOX00009861](#); [WTMFOX00009866](#); [WTMFOX00009882](#); [NCR-FOX-0281244](#), at 245; [NCR-FOX-0281348](#); [NCR-FOX-0281350](#); [NCR-FOX-0283372](#); [NCR-FOX-0282948](#); [NCR-FOX-0283348](#); [NCR-FOX-0283353](#), at 354; [NCR-FOX-0283356](#); [NCR-FOX-0283359](#); [NCR-FOX-0283362](#); [NCR-FOX-0283367](#); [NCR-FOX-0283378](#); [NCR-FOX-0283380](#); [NCR-FOX-0283381](#); [NCR-FOX-0283399](#); [NCR-FOX-0283400](#); [NCR-FOX-0283401](#); [NCR-FOX-0287173](#); [NCR-FOX-0288386](#); [NCR-FOX-0288388](#); [NCR-FOX-0288417](#); [NCR-FOX-0288421](#); [NCR-FOX-0537794](#).)

895. The actions that Wisconsin Tissue took in the 1970s after learning that PCBs could be in NCR Paper were reasonable and prudent with regard to preventing potential environmental harm to the Fox River from PCBs. (Williams Expert Report at 95.)
896. Wisconsin Tissue employed reasonable and appropriate waste water treatment methods from the 1950s and into the 1980s. Wisconsin Tissue's waste water treatment practices were consistent with industrial practices for the time. (Ford Expert Report at 26; Braithwaite Expert Report at 25.)

#### **J. City of Appleton POTW**

897. In 1935, the City of Appleton retained Greeley & Hansen, Engineers, a regionally known firm, to build its waste water treatment plant (Appleton POTW), as part of a larger project involving nine communities to help remove pollution from the Fox River. (COA-FOX-00020997, at 002.)
898. The initial Appleton POTW involved an extensive system of new interceptor sewers as well as the construction of a treatment plant that provided primary treatment through the use of bar screen, grit chambers, flocculation, settling tanks, chlorine disinfection, sludge digestion, and open sludge drying beds. (COA-FOX-00020997, at 003-009.)
899. Beginning in approximately 1960, Greeley & Hansen began design work for an upgrade to the Appleton POTW that was completed in 1964 and provided expanded primary treatment as well as adding secondary treatment through the use of sewage aeration, secondary clarifiers, sludge digesters and vacuum filtering of sludge. (COA-FOX-00008340, at 343-345.)
900. During the early 1960s, the City of Appleton initiated the separation of storm and sanitary sewers which was approximately 90% completed by 1965 at a cost of \$4.5 million. (COA-FOX-00008340, at 348.)
901. In December 1967, the City of Appleton retained a consulting firm to evaluate the City sewer system and make recommendations for future improvements. (COA-FOX-00019000, at 000.)

902. In May 1968, the Wisconsin Committee on Water Pollution issued orders to all waste water dischargers in the Fox River Valley as a follow up to a 1967 national conference regarding the pollution of Lake Michigan and its tributary basin. (NCR-FOX-0159372, at [372-420](#).)
903. The order directed to the City of Appleton to develop a report for the construction of additional treatment facilities. (NCR-FOX-0159372, at [375](#).)
904. In 1970, the City of Appleton retained Consoer, Townsend & Associates, another regionally known firm, to plan for additional plant upgrades. (COA-FOX-00036689, at [689](#).)
905. In March 1970, the WDNR acknowledged that the City of Appleton had provided the report required by the 1968 order and that the proposed schedule was appropriate. (NCR-FOX-0570834, at [834](#).)
906. Although the Appleton POTW experienced some bypass events, Plaintiffs' expert evaluation of the Appleton POTW bypass events from 1954 to 1971 states that it found no bypass events that occurred prior to primary treatment. (NCR-FOX-511429, at [446-454](#).)
907. In late 1970, the City of Appleton began use of chemical addition as an interim step to reduce solids while it was working on its plant expansion which resulted in increasing the rate of solids removal. (COA-FOX-00036689, at [690](#).)
908. The passage of the Clean Water Act in 1972 resulted in a re-evaluation of the existing plans for plant upgrades, an evaluation of the potential for additional industrial dischargers, and a review of grant options for funding which resulted in the need for extensions to the original schedule. (COA-FOX-00021020, at [025](#); COA-FOX-00036998, at [998-999](#); COA-FOX-00037000, at [000-001](#).)
909. The City of Appleton received its first Clean Water Act discharge permit (a WPDES permit) from the WDNR on March 22, 1974. (COA-FOX-00022952, at [952](#).)
910. The City of Appleton began charging user fees for discharges of BOD and TSS to the Appleton POTW in 1974. (COA-FOX-00037008, at [008](#).)
911. The City of Appleton cooperated with the WDNR throughout the treatment plant upgrade process and completed the plant upgrade in 1978. (COA-FOX-00036698, at [698-699](#); COA-FOX-00036700, at [700-701](#); COA-FOX-00023634, at [634](#); COA-FOX-00021020.)
912. The City of Appleton received its second WPDES permit on September 28, 1979. (COA-FOX-00023037, at [037](#).)
913. The City of Appleton operated and maintained its POTW in a reasonable manner appropriate for the times.

### **XIII. THE UNITED STATES GOVERNMENT'S ACTIONS UPON LEARNING OF THE HARMS FROM RECYCLING NCR PAPER**

914. On December 18, 1972, the FDA released the FEIS on PCB Rulemaking, which concerned the notice of proposed rulemaking published by FDA on or about March 18, 1972 ([37 Fed. Reg. 5,705](#)) to limit human exposure to PCBs from dietary sources. (United States' Responses to Menasha's First Set of Requests for Admission, Nos. 15-16; MONSFOX00041552, at [554](#).)
915. The FEIS on PCB Rulemaking states that prohibiting all PCB-containing paper food-packaging material regardless of level of PCB contamination would "have an adverse impact on recycling programs that would outweigh the beneficial effects, if any, that could be gained by a complete prohibition on the use of salvaged or reclaimed paper that contains low levels of PCBs." (United States' Responses to Menasha's First Set of Requests for Admission, [No. 18](#); MONSFOX00041552, at [578](#).)
916. The FEIS on PCB Rulemaking states that the Task Force received copies of FDA's draft notice of proposed rulemaking on PCBs, was briefed on the exact purpose and content of the proposed action, and had no objections to the proposed action. (United States' Responses to Menasha's First Set of Requests for Admission, [No. 19](#); MONSFOX00041552, at [583](#).)
917. By 1973, levels of PCBs in foodboard generally continued to decline to a level of less than 1 ppm, except for occasional hot spots resulting in levels of up to 5 ppm, which were generally attributed to the inclusion of significant quantities of outdated office files containing carbonless copy paper. (United States' Responses to Menasha's First Set of Requests for Admission, [No. 9](#); NCR-FOX-0530139, at [151](#).)
918. Beginning in 1975, the Government participated in the "Waste Not" recycling program, an office desk top recycling system, and recycled wastepaper. (NCR-FOX-368195, at [249-250](#); Brigham Expert Report at [8](#); Brigham Dep., [129:7-132:3](#).)
919. A Government publication, *EPA Journal*, dated November/December 1975 (Vol. One, No. Ten.), confirms that the Government participated in the Waste Not recycling program and that the contractor for this program was Shade, Inc. ("Shade") of Green Bay, Wisconsin. (MENFOX0000559, at [630](#).)
920. The Waste Not recycling program resulted in recovery of 15 tons of recycled paper each month from EPA headquarters. Shade's desktop recycling system was recommended by the Government's source separation guidelines, and, by 1976, sixteen federal offices employed this recycling system. (Brigham Expert Report at [8](#).)
921. Shade was a supplier of post-consumer office wastepaper to recycling mills in Wisconsin. ([NCR-FOX-0161434](#); Brigham Expert Report at [8-9](#).)
922. The recycling containers provided by Shade for the Waste Not recycling program listed the following grades of paper as desired for recycling: letterhead, stationery, tabulating machine cards, and paper from copy machines and computer printouts.

- (MENFOX0000559, at 630; Brigham Dep., 132:8-133:1.) These recycling containers also had a prohibition against file materials printed on them. (Wand Dep., 109:6-22.)
923. The Government, when it participated in the Waste Not recycling program, saved “high-grade white paper” for recycling. (MENFOX00005599, at 630.)
924. In the introduction to its “Source Separation for Materials Recovery Guidelines,” the Government stated that “[t]he materials that must be separated for recycling are high-grade office papers (white ledger, computer print-outs, and computer cards), corrugated containers and newspapers.” (WTMFOX00009629, at 639.)
925. The Source Separation for Materials Recovery Guidelines define “[h]igh-grade paper” as letterhead, dry copy-papers, miscellaneous business forms, stationery, typing paper, tablet sheets and computer printout paper and cards, commonly sold as “white ledger,” “computer printout” and “tab card” grade by the wastepaper industry. (Brigham Dep., 126:24-127:21; WTMFOX00009629, at 642.)
926. To the extent the white ledger grade of recovered fiber included sheets or pieces of NCR Paper manufactured during the Production Period (i.e., the period between 1954, when commercial manufacturing of PCB-containing NCR Paper began, and the Spring of 1971, when PCBs were removed from NCR Paper), this grade of recovered fiber would contain paper containing small amounts of PCBs. (GPFOX00005657, at 660.)
927. The Government included in its recycling efforts miscellaneous business forms. (WTMFOX00009629, at 642.) The Waste Not program did not seek to recycle miscellaneous business forms. (Brigham Dep., 133:2-9.)
928. Some business forms manufactured during the Production Period were manufactured with NCR Paper. (Klass Dep., 106:7-22.)
929. The Bergstrom Mill received wastepaper from the EPA through the Waste Not program and this paper was pulped at the Bergstrom Mill which discharged into the Lower Fox River. (Wand Dep., 311:17-312:24.)
930. Testing at the Bergstrom Mill revealed that wastepaper delivered to it through the Waste Not program contained “significant PCBs” because some of this paper was “pre-1971 NCR Paper.” (Wand Dep., 108:6-24.) The Bergstrom Mill gave a “heads-up” to Shade as to this fact in late 1975. (NCR-FOX-0161441; Wand Dep., 108:25-109:11.)
931. On or about September 5, 1975, the Bergstrom Mill sent a letter to the EPA stating that “we have found trace amounts of PCBs in over half of the wastepaper we purchase with the heaviest concentrations being in office waste,” and that these trace amounts were attributable to “the disposal of old carbonless from existing office files.” (NCR-FOX-0163339.)
932. In or around January 1976, the Bergstrom Mill had conversations with the EPA concerning “PCBs generated in the paper recycling process.” (GLTFOX00005234, at 250-251.)

933. In or around January 1976, the EPA told the Bergstrom Mill that “segregating old carbonless from office files is a monumental task that would contribute little to the effort to remove PCBs” and that the EPA considered establishing a program “to identify all carbonless paper whether in forms or cutsizes purchased before 1972 which is still in inventory in any federal facilities.” (*Id.* at 250.)
934. The Government, through its participation in the Waste Not program, put wastepaper containing NCR Paper manufactured during the Production Period into the recycling marketplace after it knew or should have known that recycling this NCR Paper could result in the discharge of PCBs to water body. (Brigham Expert Report at 8, 16-17, 19; GPFOX00033019; Brigham Dep., 129:7-132:3; United States’ Responses to Menasha’s First Set of Requests for Admission, No. 12; NCR-FOX-0563271, at 295; MONSFOX00041552, at 564.)
935. A March 5, 1976 report made by the Fort Howard Mill states that the Fort Howard Mill was cognizant of “the fact that there was a tremendous depository, especially in business and Government files, of paper containing a high concentration of PCBs.” (NCR-FOX-0107781.)
936. The basis for the Fort Howard Mill’s understanding, as stated in its March 5, 1976 report, that Government paper contained PCBs, was based on testing it conducted on older wastepaper samples. (Schneider Dep., 161:17-162:5.) A 1977 Report sponsored by the EPA, “PCBs Involvement in the Pulp and Paper Industry,” found that the entry of PCBs into the paper industry was completely unintentional, that the industry responded well to the need for reduction of PCB levels in food packaging, and that waste treatment for suspended solids removal would significantly reduce PCB discharges from the industry. (United States’ Responses to Menasha’s First Set of Requests for Admission, No. 10; NCR-FOX-0530139, at 153.)
937. A 1977 EPA publication, “Office Paper Recovery: An Implementation Manual,” included a memorandum from the EPA Administrator announcing that in the first year of the Federal Government program, “Use It Again, Sam!,” the EPA collected “over 285,000 pounds of high-grade office wastepaper,” earning “over \$8,000 in revenue.” (GPFOX00006868, at 904; *see also* MENFOX00005599, at 630.) The program was later expanded to the entire Federal Government.
938. In or about June 1979, the EPA released a guidance document entitled, “EPA’s Final PCB Ban Rule: Over 100 Questions & Answers To Help You Meet These Requirements” (the “PCB Ban Rule Guidance”). The PCB Ban Rule Guidance concerned the final rulemaking published by the EPA on or about May 31, 1979 (44 Fed. Reg. 31,514), entitled “Final Rule for Polychlorinated Biphenyls (PCBs.) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.” (United States’ Responses to Menasha’s First Set of Requests for Admission, Nos. 21-22; GPFOX00075902.)
939. The PCB Ban Rule Guidance stated that although carbonless copy paper was no longer made with PCBs, supplies of this paperstock still existed, and most of this paperstock was

in files. (United States' Responses to Menasha's First Set of Requests for Admission, [No. 23](#); GPFOX00075902, at [924](#).)

940. The PCB Ban Rule Guidance stated that “[b]ecause the amount of PCB on each sheet is extremely small and no inexpensive method of separating PCB from non-PCB carbonless paper has been developed, EPA has authorized the use of existing PCB carbonless copy paper indefinitely.” (United States' Responses to Menasha's First Set of Requests for Admission, [No. 24](#); GPFOX00075902, at [924](#).)
941. The PCB Ban Rule Guidance reflects the EPA's balancing of two goals: (1) protecting people from the potential hazards of PCBs; and, (2) furthering recycling — “an important environmental goal of the country.” As a result, the EPA did not ban the continued use of existing NCR Paper when it enacted the May 31, 1979 PCB ban regulations, nor did it preclude the recycling of NCR Paper in the manufacture of paper. (Brigham Expert Report at [27-28](#); Brigham Dep., [74:3-75:2](#), [189:5-12](#).)
942. The Corps has dredged parts of the Lower Fox River and Green Bay, Wisconsin Site from time to time during the past 150 years to maintain the navigable channel in the Lower Fox River, and it has performed navigational dredging in the Menasha Channel and Neenah Harbor Areas of the Lower Fox River at various times. (Dkt. 416 ¶ [13](#).)
943. The Corps' records indicate that from the De Pere Dam to Green Bay Reach, as well as Green Bay, over 15.9 million cubic yard of sediment have been dredged from the navigation channel since 1957. (MENFOX00005700, at [762](#).)
944. Sediment resuspension is a by-product of every Corps dredging project. (MENFOX00006098, at [109](#).)
945. Sediments resuspended during the Corps' dredging operations pose a variety of water quality and ecological concerns. (MENFOX00006098, at [108](#).)
946. The Government dredged in the Lower Fox River, resulting in the resuspension of contaminated sediments, despite Government knowledge that PCB contamination existed in the Lower Fox River. (Brigham Expert Report at [16-17](#), [19](#); Dkt. 416 ¶ [13](#); MENFOX00005700, at [762](#); MENFOX00006098, at [108-109](#).)

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Respectfully submitted,

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